Journal OF THE AMERICAN DIETETIC ASSOCIATION

VOL. 18, NO. 6 JUNE, 1942

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Why We Need Vitamins[1]

VAN R. POTTER, Ph.D.[2]

McArdle Memorial Laboratory (for Cancer Research), Medical School, University of Wisconsin

FOR many years the science of nutrition has been taking tremendous forward strides that have resulted in the accumulation of knowledge which, when applied, has effected a marked decrease in disease and human suffering. Concomitantly, biochemists have taken an increasing interest in the nature of those mysterious entities called enzymes which until recently have been known only by the effects they produce. It was early recognized that enzymes and vitamins had in common the property of acting in small amounts, that is, catalytically, but it remained for the chemists to show the true nature of the common denominators which link enzymes and vitamins together. Our purpose at present is to sketch an overall picture of the relation between the two groups of substances.

THE CLASSIFICATION OF FOODSTUFFS ACCORDING TO FUNCTION

For purposes of discussion it is useful to classify our foodstuffs according to the uses to which they are put, namely:

1. As structural material (in a supportive sense).[3]
2. As fuel.
3. As catalytic material.

This classification is, of course, not new. It was implied, for instance, by Drummond (1) when he defined a vitamin as "effective . . . in amounts minute by comparison with those of the foodstuffs which supply the *structural material* and the *energy*." (Italics ours). Many foodstuffs clearly fall into more than one category. Calcium, for instance, is obviously needed for structural purposes in bone formation. On the other hand, calcium is needed for catalytic purposes since it is known that calcium ions are needed to complete the blood-clotting mechanism. It is obvious that the amount of calcium required for the latter function is but a small fraction of the amount needed for bone formation.

In the case of carbohydrate it is clear that the largest proportion of this foodstuff is used for fuel, that is, to provide energy for the organism. Yet a certain proportion of the ingested carbohydrate is apparently used for the production of special conjugated proteins which are of importance in cartilaginous structures. It is also possible that some carbohydrate is needed for certain enzymes. For instance, ribose, a 5-carbon sugar which is an essential component of various enzyme systems, may conceivably be derived from other sugars in the body. If not, it may eventually be called a vitamin. Thus far there is no evidence for the latter.

Most people would probably place fats wholly in the fuel category. The appearance of structural function in certain instances is probably only superficial. Apparently no one has suggested a catalytic function for fats, but the occurrence of a large proportion of fat in certain intracellular bodies is suggestive in view of the fact that the latter may have catalytic function.

The role of proteins as foodstuffs is also interesting to consider. It is well known that excessive amounts of protein can be burned as fuel. Certainly proteins are important as structural material, and it is equally certain that a considerable fraction of protein finds its way into the multitude of enzymes which, as we know, are fundamentally protein in nature. One cannot but wonder how much of the protein of the body is enzyme protein and how much is structural protein. At present no answer is available, but there is probably a greater fraction of protein in the form of enzymes than most people would predict, and it seems rather likely that much of the protein of the body which is now considered to have a structural function, actually has both a structural and a catalytic function. Future work will possibly reveal that certain fractions of the ingested protein, carbohydrate and fat tend to fall into one category while other fractions have an entirely different function. Thus the empiricism of the past will give way to rational nutritional measures.

[1] Received for publication March 15, 1942.

[2] Dr. Potter received his doctorate under Professor C. A. Elvehjem. As National Research Council Fellow, he studied the physiological action of the antipellagra vitamin with Professor H. von Euler in Stockholm, 1938–39.

[3] It is desirable at the outset to restrict the sense of the words "structural material" to the concept of *supporting* structures such as bone, skin, cartilage, connective tissue in general, and the stroma of the individual cells and organs. This is to forestall the argument that nicotinic acid amide, for example, serves a structural purpose because it is needed to complete the structure of certain coenzymes.

Trace elements are much easier to classify than the foregoing foodstuffs. It is obvious that they are not used for fuel and also quite apparent that they are not used as structural material. The fact is that the trace elements, such as copper, cobalt, zinc, manganese and magnesium, most certainly have catalytic function. It seems reasonable to suppose that all trace elements function in connection with specific enzyme systems either as coenzymic ions loosely attached to specific proteins as, for example, magnesium in the glycolytic system, or as a definite part of a metallo-organic compound, such as iron in cytochrome *c*.

The vitamins are likewise easy to classify since it is apparent that they are not used for fuel or for structural purposes. It is clear that the vitamins must have a catalytic function in the body, and in many instances this function is quite well understood.[4] As a matter of fact, knowledge of enzymes has in some instances preceded the discovery of vitamins. Thus, in his nutritional experiments on the antipellagra vitamin, Elvehjem was considerably fortified by the knowledge that nicotinamide is a constituent of coenzymes I and II. Following the indications of his successful investigation, various people have been led to attempt to prove that adenine and ribose are also vitamins, since they are also components of coenzymes. Thus far no clear-cut demonstration has appeared and so we simply conclude that either the animals with which we are working are able to synthesize these compounds themselves, or that they possess an intestinal flora which performs the synthesis. Even if some ardent investigator should succeed in showing that these compounds are "vitamins" under certain circumstances, the discovery may seem like an anticlimax to the sophisticated nutritionist.

If, then, we take the position that in all probability vitamins are merely components of essential catalytic systems which the body cannot synthesize, it is clear that to understand vitamin function we must understand the function of the various catalytic systems of which they are a part. For several vitamins a fragmentary picture can be given and for others the picture is still completely obscure. This is not surprising in view of the rapidity with which the more recently discovered vitamins have come upon the scene. A brief résumé is given in table 1 and details have been described elsewhere (2). The biocatalytic function of a compound like nicotinic acid would seem to be fairly well understood but it must be emphasized that there is a vast no-man's land between the enzyme chemist on the one hand, the physiologist, the nutritionist, the pharmacologist, and the clinician on the other. Eventually someone will have to bridge the gap between the outward symptoms of pellagra and the fact that nicotinic acid is a component of coenzymes I and II. Either the sequence of events which connect the foregoing will be completed, or nicotinic acid will be shown to have additional functions. In the latter case we may presume that the functions will also be catalytic in nature.

TABLE 1

*Enzyme-vitamin relationships, including hypothecated possibilities**

VITAMIN	ENZYME SYSTEM	COENZYME OR PROSTHETIC GROUP	SUBSTRATE
Thiamin	carboxylase (α-keto acid oxidase)	cocarboxylase: diphosphothiamin	pyruvic acid (α-keto glutaric acid)
Nicotinic acid	numerous specific proteins, *i.e.* dehydrogenases, for the substrates listed	coenzyme I: cozymase: diphosphopyridine nucleotide	lactic acid, malic acid, β-hydroxybutyric acid, alcohol, glyceraldehyde diphosphate, glucose**, glutamic acid**
		coenzyme II: Warburg's coenzyme: triphosphopyridine nucleotide	glucose-6-phosphate, iso-citric acid, glucose**, glutamic acid**
Riboflavin	xanthine oxidase	alloxazine adenine dinucleotide	xanthine, hypoxanthine
	d-amino-acid oxidase	" " "	*d*-amino-acids
	(coenzyme II-cytochrome reductase)	(riboflavin phosphate)	coenzyme II
	(coenzyme I-cytochrome reductase)		coenzyme I
	(succinic dehydrogenase)		succinic acid

* Indicated by parentheses.

** These substrates can be oxidized in the presence of either coenzyme I or II.

[4] While it seems certain that vitamins function by being built into enzyme systems in the body, it does not follow that the converse is true. It is likely that most of the enzymes in the body do not have vitamin precursors.

THE NATURE OF THE BIOCATALYSTS

Let us now look into the nature of the biocatalysts[5] which we have presumed to be the ultimate destination of the ingested vitamins. Ostwald defines a catalyst as "an agent which affects the velocity of a chemical reaction without appearing in the final products of the reaction." This is at least a better definition than that which suggests that a catalyst accelerates a chemical reaction without itself taking part in the reaction. One of the features of biocatalysts is that they probably enter into chemical combination with the reactants during the course of the catalysis but as the reaction is completed the biocatalyst is regenerated into its original form. That is, an enzyme molecule combines with its substrate, effects a change in the substrate, and then detaches from it and attacks the next substrate molecule. The enzyme undergoes a *cycle* of changes, or an oscillation between various states. Thus a small number of enzyme molecules can bring about changes in a very large number of substrate molecules, and the ratio of substrate molecules to enzyme molecules can be very large. Just how large is illustrated by the fact that in various instances one enzyme molecule will combine with, cause to react, and dissociate from 4000 substrate molecules per minute. This speed of action is difficult to visualize in terms of bouncing balls, but is quite comparable to the speed of the alternations in electric current in most A.C. lighting systems.

It appears that biocatalysts in general are protein molecules and that when vitamins become part of a biocatalytic system they are elaborated into a special non-protein molecule which is then associated with a specific protein and is called either a coenzyme or a prosthetic group depending on how tightly it is bound to the protein. Prosthetic groups are more firmly bound than coenzymes, and in many cases the latter can be removed by dialysis. The protein has a special configuration which enables it to come into close relation with the substrate and presumably to effect a reaction between the substrate and the special group. The enzyme may then react with a second substance to convert this group back to its original form. By this time the changed substrate has left the enzyme and the latter is therefore ready to repeat the cycle. These complex biocatalysts are in many cases extremely labile and probably delimit the environmental adaptability of life itself. Lethal temperatures are those which destroy the most sensitive of these biocatalysts. Poisons are toxic because they destroy certain biocatalysts. Certain other properties of life are exhibited by these enzyme systems and it might not be too facetious to say that life began when a small group of enzymes became organized for mutual benefit.

[5] We have used the term *biocatalyst* to distinguish the catalysts of living material from catalysts in general. The term has been similarly used by others, including Mansfield Clark.

THE FUNCTION OF THE BIOCATALYSTS

The role of the biocatalysts in the metabolic scheme of the living organism is now quite clear, though still very incomplete. Referring back to the original three categories of function, it may be said that the biocatalysts effect the utilization of the fuel foodstuffs, yielding energy which is used to perform work and to effect the syntheses for which the structural foodstuffs are the starting materials. According to present concepts, there is some degree of unity in the picture of energy utilization. Those energy-yielding reactions which have received the most careful study have all been shown to be capable of converting this energy into phosphate esterification, for which the key compound appears to be adenosinetriphosphate. When this compound is hydrolyzed to adenylic acid and inorganic phosphate, energy is released. This energy can apparently be used for muscular work or for various forms of metabolic work and syntheses. The supply of adenosinetriphosphate may be looked upon as a reservoir of energy which is depleted by various forms of work, and refilled by the utilization of the energy of the fuel foodstuffs whose combustion results in a resynthesis of adenosinetriphosphate from adenylic acid and inorganic phosphate (3, 4). Just as a storage battery can be recharged by electrical energy from a variety of power sources (waterfall, windmill, steam engine, gasoline engine, etc.) so the bodily energy reservoir can be recharged in several ways. In the case of the storage battery, the recharging cannot be brought about simply by the falling of water, the blowing of wind, or the burning of gasoline. A mechanism for converting the potential energy of water, wind or gasoline into electrical energy must be introduced into the set-up. In the case of the gasoline engine it is not enough that a spark be provided to ignite the gasoline. The object is not merely to burn the fuel, but to capture the energy of the fuel and to do something useful with it. In the case of the gasoline engine, one small engine plus a dynamo, if kept in good repair over a period of years, can convert thousands of gallons of gasoline into electrical power. The biocatalysts whose function is understood are somewhat comparable to the gasoline engine, the windmill, and so on. Each has a slightly different fuel but all seem to be connected to a system whose end result can be expressed in terms of restoring the energy reservoir.

The foregoing crude and imperfect analogy may to some degree explain the function of biocatalysts in the bodily economy. Just as mechanisms are required to charge the storage battery, other mechanisms are required to convert the stored energy

back into work. The multiplicity of electrical appliances in the average home bears testimony to the number of kinds of work to which electrical energy can be converted. There are probably at least as many uses to which the energy of phosphorylation can be put in the body. For each use a mechanism must be present, and possibly some of the vitamins are involved in these mechanisms. In the main we know even less about the way in which energy is used than we do about how it is captured and stored.

CONCLUSIONS

This picture of the function of the biocatalysts and therefore of the vitamins has been deliberately couched in general terms. The channels of energy utilization, storage, and work performance will no doubt be shown to be much more complex by future research, but it is felt that the underlying philosophy will not change materially.

The implications of these concepts are clear enough to have practical significance. The question of the rate of replacement of the various biocatalysts is of the utmost importance, for it probably determines the daily vitamin requirements. Just as the gasoline engine which charges the storage battery must be replaced oftener in some circumstances than in others, so the requirement for certain vitamins will be likely to be increased in various hypermetabolic states. Likewise, stages of growth will probably require greater quantities of certain vitamins than stages of maintenance. Variations in fuel will require variations in the vitamin intake. Various drugs and poisons and pathogenic bacteria may destroy particular biocatalysts whose replacement will then require an increased ingestion of the component vitamin. There is a strong possibility that the peculiar metabolism of cancer tissue may be related to the nutritional history of the patient. One is forced to conclude that the nutritionist will be unable to establish categorically an exact daily dose of the various vitamins, but must devote an increasing amount of research toward finding the vitamin requirement when the body is operating under various degrees of duress.

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Protecting Foods from Gas and Sabotage

The nonpersistent gases (*i.e.* those readily dispersed by wind, air currents, and rain), such as chlorine and phosgene, produce damage to the lungs when inhaled, and although foods may absorb them to some extent on exposure to fairly high concentrations they are seldom rendered unfit for consumption. Even prolonged exposure to high concentrations of nonpersistent gas of the phosgene type, such as might easily occur in a confined space, is more likely to impair the palatability of food than to render it unwholesome. Milk so exposed may have its taste slightly affected, but its palatability can be restored by boiling. Cheese and butter may bleach slightly at the surface, but when the bleached portions are cut away the remainder is edible.

More dangerous to foodstuffs are the persistent liquid blister gases, of which the outstanding representative is mustard gas, which cause incapacitation by producing acute inflammation of the skin, eyes, and throat. Nonarsenical blister gases are rapidly absorbed by uncovered fatty foodstuffs, including milk, cream, and cheese, so as to render them unpalatable, and since there is no effective treatment, fatty foods so contaminated are probably dangerous. Foods that have been in contact with arsenical blister gases of the lewisite type should be regarded with the greatest suspicion, as there is considerable danger of arsenical poisoning.

The protective value of the food packages commonly employed increases with the imperviousness of the material and the tightness of the cover. Sealed cans or metal drums give complete protection against all types of gases. Waxed cartons if well sealed afford good protection. Fairly good protection is given by cans with well-fitting lids and by glass bottles covered by greaseproof paper.—*Public Health Reports, March 20, 1942.*

A Vitamin Primer[1]

THE following, which is abbreviated for ready reference, summarizes our knowledge of the vitamins to date, as presented by Dr. H. A. Waisman, Department of Biochemistry, University of Wisconsin, at the Nutrition for Defense Refresher Course, sponsored by the State Nutrition Committee at the Memorial Institute, University of Wisconsin, February 7, and revised to May 15, 1942.

THE FAT-SOLUBLE VITAMINS

Vitamin A ($C_{20}H_{29}OH$). (β carotene as pro-vitamin A, $C_{40}H_{56}$)

Properties: Fat-soluble. Has general properties of an alcohol. Quite stable in absence of air at high temperature. Readily destroyed on exposure to air and light.

Function: Promotes growth. Aids in maintaining highly accurate vision, resistance to infection, and adaptability to semi-darkness. Necessary for normal tooth formation.

Symptoms Associated with Deficiency: Dry skin. Lack of vigor. Poor teeth. Poor resistance. Gastro-intestinal distress. Weakness. Renal calculi. Loss in weight. Xerophthalmia.

Daily Requirement: Adults, 5000 I. U. Chil- (1–12 years), 1500 to 4500 I. U., depending upon age; (13–20 years), 5000 I. U. During gestation and lactation, 6000 to 8000 I. U.

Occurrence in Natural Foodstuffs: Chiefly liver, butter, cream cheese, eggs, leafy green vegetables, milk, fish liver oils, apricots, pumpkin, and sweet potato.

Vitamin D (D_2 the activation product of irradiated ergosterol, $C_{28}H_{43}OH$; and D_3, the activation product of irradiated 7-dehydro cholesterol, $C_{27}H_{43}OH$).

Properties: Fat-soluble.

Function: Prevents rickets in infants. Important for normal tooth formation and structure. Essential for proper utilization of calcium and phosphorus.

Symptoms Associated with Deficiency: Low blood calcium and phosphorus. Predisposition to dental caries. Poor growth. Poor assimilation of calcium and phosphorus. Enlarged joints. Rickets. Tetany. Softening of cranial bones. Osteomalacia. Poor healing of fractures.

Daily Requirement: Children (1–12 years), 400 to 800 I. U. Adults, recommended allowance, 400 I. U.

Occurrence in Natural Foodstuffs: Chiefly fish liver oils, egg yolk, irradiated foods, liver.

Vitamin E (alpha-tocopherol, $C_{29}H_{50}O_2$, highest activity; beta and gamma tocopherols, less active).

Properties: Fat-soluble. Oxidized in presence of air. Decomposes upon irradiation with ultraviolet.

Function: Still uncertain—may be involved in certain nervous diseases and muscular derangements. Effect upon human reproduction not proved.

Occurrence in Natural Foodstuffs: Chiefly leafy green vegetables, wheat germ oil, cottonseed oil, liver.

Vitamin K (a variety of certain chemical compounds related to the naphthaquinones have vitamin K activity).

Properties: Fat-soluble. Decomposed by alkalies. Stable when protected from light.

Function: Essential in the formation of a substance which causes the clotting of blood within normal time limit, thus preventing hemorrhage.

Daily Requirement: Not definitely established, but the usual clinical dosage has been 1 to 2 mg. orally.

Occurrence in Natural Foodstuffs: Green leafy material, egg yolk, liver, hemp seed.

THE WATER-SOLUBLE VITAMINS

Vitamin C (ascorbic acid, $C_6H_8O_6$, the lactone of threo-3-keto-hexonic acid).

Properties: Water-soluble. Unstable at high temperatures when exposed to air. Easily

[1] *Editor's Note:* This tabular summation covers our present knowledge concerning the several known vitamins up to May 15, 1942. The object of arranging the material in primer form is to make this information readily accessible to the dietitian engaged in the work of the National Nutrition Program. In view of the many misconceptions concerning the vitamins, all information given to the laity must, of course, be well-supported by authoritative opinion and scientific fact, both of which, we believe, are reflected in this summary. The foods mentioned are listed in descending order of importance as vitamin sources.

destroyed in foods when cooked in copper utensils.

Function: Prevents scurvy. Maintains normal gum structure. Required for growth and maintenance of bones and teeth.

Symptoms Associated with Deficiency: Tender joints. Caries. Loose teeth. Weakness. Poor resistance to infections. Weakened blood capillaries. Anemia. Swollen joints. Fragile bones, etc.

Daily Requirement: Adults, 75 mg. Children (1–12 years), 30 to 75 mg.; (13–20 years), 80 to 100 mg.

Occurrence in Natural Foodstuffs: All citrus fruits and to a lesser degree other fruits, fresh vegetables, certified milk, liver and kidney.

Vitamins of the B Group

1. Thiamin (vitamin B_1, antiberiberi, antineuritic, antipolyneutritic, $C_{12}H_{17}N_4OSCl \cdot HCl$, a pyrimidine, thiazolium derivative).

   Properties: Water-soluble. Destroyed by sustained elevated temperatures. Sensitive to alkali. Destroyed by sulfite. Not readily destroyed by oxidation.

   Function: Essential for utilization of carbohydrates as a part of coenzyme, cocarboxylase. Maintains and stimulates appetite and normal intestinal functions. Necessary for normal nerve action. Specific for the deficiency disease, beriberi.

   Symptoms Associated with Deficiency: Poor appetite. Digestive disturbances. Irritability. Nervousness. Weakness. Slow heart rate. Cardiovascular upsets. Loss in weight. Multiple neuritis. Edema and muscular atrophy. High blood pyruvic acid.

   Daily Requirement: Man, 1.5 to 2.3 mg. Woman, 1.2 to 1.8 mg. Children (1–12 years), 0.4 to 1.2 mg; (12–20 years), 1.2 to 2.0 mg.

   Occurrence in Natural Foodstuffs: Chiefly pork muscle, rolled oats, whole wheat, rye (whole grain), walnuts, green peas, Lima beans, peanuts, milk, corn, beef liver, egg, lean beef, potatoes.

2. Riboflavin (vitamin G, lactoflavin, ovoflavin, $C_{17}H_{20}N_4O_6$, ribose alloxazine derivative).

   Properties: Water-soluble, greenish fluorescent pigment. Stable to heat. Deteriorates on exposure to light. Rapid destruction in alkali and exposure to light.

   Function: Component of flavoproteins which act as important enzymes in tissue respiration. Prevents abnormal eye changes which result in dimming of vision. Necessary for maintenance of normal nerve structure. Necessary for normal growth.

   Symptoms Associated with Deficiency: Impaired growth. Lack of vigor. Impairment of tissue respiration. Weakness. Loss of body weight. Glossitis. Cheilosis (fissures at corner of mouth). Neuritis. Vascularizing keratitis. Cataract.

   Daily Requirement: Man, 2.2 to 3.3 mg. Woman, 1.8 to 2.7 mg. Children (1–12 years), 0.6 to 1.8 mg.; (12–20 years), 1.8 to 3.0 mg.

   Occurrence in Natural Foodstuffs: Chiefly beef liver, milk, eggs, lean beef, pork muscle, whole wheat, oats.

3. Nicotinic Acid (niacin, P-P vitamin, antiblacktongue factor. $C_6H_5NO_2$, 3 pyridine carboxylic acid).

   Properties: Most stable of water-soluble vitamins. Not affected by acids, alkali, heat.

   Function: Component of two important coenzymes, coenzyme I (cozymase) and coenzyme II, both concerned in glycolysis and tissue respiration.

   Symptoms Associated with Deficiency: Erythematous skin lesions. Inflammation of all mucous membranes. Anorexia. Loss in weight. Nervous disturbances. Dementia. Diarrhea. Frank pellagra with accompanying glossitis, dermatitis, etc.

   Daily Requirement: Man, 15 to 23 mg. Woman, 12 to 18 mg. Children (1–12 years), 4 to 12 mg.; (12–20 years), 14 to 20 mg.

   Occurrence in Natural Foodstuffs: Chiefly beef liver, peanut butter, beef kidney, chicken, pork loin, salmon, yeast (dry), ham, brown rice, whole wheat.

4. Pyridoxine (vitamin B_6, rat-antidermatitis vitamin, $C_8H_{11}NO_3 \cdot HCl$, a hydroxymethyl pyridine derivative).

   Properties: Water-soluble. Less soluble in ether, alcohol, chloroform, and fat. Destroyed on exposure to light.

   Function: Not definitely established. May be involved in fatty acid metabolism or synthesis of fat from protein.

   Symptoms Associated with Deficiency: Indefinite. May be involved in certain muscular derangements. Possible role in prevention of certain anemias.

   Requirement: Animal experiments indicate requirement is approximately that of thiamin.

   Occurrence in Natural Foodstuffs: Chiefly whole wheat, soy bean, milk, beef liver, yellow corn, beef kidney, brewers' yeast, pork muscle, cabbage.

5. Pantothenic Acid (chick antidermatitis factor, filtrate factor, etc. $C_9H_{17}O_5N$, N-(α,γ,dihydroxy-β,β,dimethylbutyryl)-β-amino-propionic acid).

Properties: Water-soluble, stable to heat, destroyed by strong acids or alkalis, occurs in natural materials in combined form.
Function: Role in normal metabolism is unknown.
Symptoms Associated with Deficiency: Precise role in human physiology not established.
Requirement: Unknown, but animal experiments indicate it to be somewhere between thiamin and nicotinic acid figures.
Occurrence in Natural Foodstuffs: Chiefly brewers' yeast (dry), liver, egg yolk, and peanuts.

6. Choline ($C_5H_{15}O_2N$, a quaternary ammonium hydroxide, a well-known part of lecithin molecule).
Properties: Strong base, but usually occurs in combined form.
Function: Related to fat metabolism, probably acts as a methylating agent in the body. Necessary for normal kidney and liver function.
Requirement: Very high in young animals; human requirement not known.
Occurrence in Natural Foodstuffs: Chiefly liver, wheat, corn, flour, rice.
7. Biotin ($C_{11}H_{18}O_3N_2S$, for methyl ester; structural formula almost completely established).
Properties: Fairly stable substance, destroyed by heat.
Function: Counteracts egg-white toxicity. Growth factor for chicks. Prevents specific dermatitis in rats and chicks.
Distribution: Widely distributed in nature, with yeast, liver, meats, and milk the best sources.
8. Inositol ($C_6H_6O_6$, an H—OH group on every carbon link of the hydrogenated benzene ring).
Properties: Sugarlike compound, very soluble in water.
Function: Unknown. Importance in nutrition has been shown through rat and mice experiments. Some evidence for lipotropic action.
Distribution: Exists in all grains, heart muscle, and yeast.
9. Additional Factors: Factor U and folic acid, both of which are probably identical. Para-amino-benzoic acid, for which there is some evidence of vitamin-like activity and inhibiting action on the bacteriostatic properties of sulfa drugs.

Salaries for Hospital Personnel

By giving a salary to hospital personnel to completely cover services rendered, instead of providing a place to live and food to eat as a part of the salary, the hospital administration is merely applying business principles. The individual needs no longer revolt because he is being "spoon fed" or regimented. He may eat where, what, and when he chooses, considering only his financial limitations. Budget control has been differentiated. The department still has its figures for control, but the individual now has to budget his food allowance. The selection and cost control of the individual meal, once the dietitian's problem—and it was a problem—has been transferred to some extent to the personnel themselves. This is certainly a logical arrangement. The earlier an individual develops independence and initiative, the happier his state of mind. Human nature just functions that way.

If the personnel feels the prices are too high for certain foods, they now have money and can shop around. Previously, they felt that they were forced to endure foods distasteful to them or spend extra money to escape the situation. We spend much time in planning foods, supervising their preparation, displaying them attractively on the counters in order to offer the greatest variety possible at varying prices to suit the different groups of people we serve.

It has been said that the health of the employees in the lower brackets has suffered as the result of exchanging money for food. Our experience has not justified this criticism Under the old system the plate waste in the lower bracket cafeteria was great. From studies we found that this group took everything on the menu because it was "coming to them," but a check on the waste revealed that they consumed only the foods they liked. We believe the families of the people in the lower income bracket have been able to raise their nutritional status with the extra money.—*Lute Troutt, Hospitals, 16: 4, 1942.*

Recent Investigations in Mineral Nutrition[1]

GENEVIEVE STEARNS, Ph.D.

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NORMAL nutrition can be defined as the ingestion, assimilation, and utilization by the body of adequate amounts of all substances needed in body metabolism. Such a definition is easier to state than to determine. Intake and assimilation are not necessarily related. The term nutrition is too often associated solely with intake, and conclusions are drawn which have no justification in terms of true nutrition. It is possible to have abnormal assimilation in the apparently healthy individual. Two patients seen recently in our clinic illustrate this possibility.

The first, a girl of 14 years, came to the clinic because of sudden and devastating dental caries—some 26 cavities appearing within a few months. She was apparently in a state of good nutrition, complained of no digestive disturbances, and her diet had been well above average. Clinical examination gave no clue. Metabolic study showed she was unable to retain calcium and phosphorus, even though ample vitamin D was provided. Here was a serious defect of utilization, present in a seemingly healthy individual. It seemed probable the defect might lie in failure to absorb sufficient vitamin D. If this were true, the other fat-soluble vitamins would be poorly absorbed also. Her vitamin A status was measured by dark adaptation, and found to be subnormal, though she had been ingesting over 20,000 I.U. vitamin A daily for the previous three months. When bile salt therapy was prescribed to improve the absorption of fats and the vitamins carried by fats, the dark adaptation became normal within a few days and as vitamin D was absorbed the retention of calcium and phosphorus increased and the caries became arrested. The girl had no steatorrhea or other gastro-intestinal disturbance; in fact, she presented no clinical symptoms which would have explained the difficulty. She could have been used as an example of utter lack of relationship between nutrition and dental caries, yet her nutritional deficiency was very real. Here was a defect in nutrition but not of intake. Had the deficiency gone on, in time she would undoubtedly have presented serious clinical symptoms, such as shown by the second patient whose case has been reported elsewhere in detail (1), but will be briefly reviewed here.

This patient, a woman of 35 who came to the Orthopedic Clinic because of back pain and severe progressive deformity of the spine, looked like a woman of 70 or more and was badly deformed. Roentgenograms showed very severe osteoporosis of all bones but especially of the vertebrae. Amenorrhea had been present for two years. Her diet had been good. Her history revealed that at the age of 19 she had suffered from steatorrhea and had recovered under diet therapy. Later, ingestion of a normal diet provoked no diarrhea and for several years the patient remained clinically well, except that she had lost all her teeth before she was 30. At about 33 years of age she noted the apparently sudden onset of her back deformity. On examination it was found that gastric acidity was low, her absorption of fat poor, and that these defects were associated with poor absorption of calcium. The disease apparently had progressed rapidly during the previous two years, but the defect of utilization must have been present for a long time previous to her known osteoporosis. Diet therapy was instituted, including a low-fat diet containing an ample amount of skim milk and vitamin D, also bile salt therapy, and the patient showed spectacular improvement in the course of a few months. Temporary return to habitual diet, without bile salt therapy, was marked by sharp decrease in fat absorption.

It is to be emphasized that both these patients had ingested better than average diets. By clinical examination alone, the first would be considered as a healthy subject while the second must have seemed healthy for a long period while depletion was progressive. Only careful metabolic study disclosed the error in nutrition in these two patients, yet the error was serious for both. To have assumed in the first case that the dental caries bore no relationship to nutrition would have been faulty. To have assumed that, because the second patient showed no obvious steatorrhea for years, her absorption and utilization were normal during that time, would have been equally erroneous. These

[1] Received for publication, March 14, 1942.

may seem to be extreme examples, yet we can cite others which illustrate how easily errors of judgment may be made unless one keeps always in mind that nutrition includes utilization and that adequate intake is not necessarily indicative of adequate nutrition, even in the seemingly normal individual.

We commonly find wide variation in the ability of any group of children to utilize calcium of the diet; which child will prove to be efficient or inefficient in this respect cannot be told by inspection. This brings up the question of defining another term which can stand frequent re-examination—"normal." What is "normal" nutrition—or "normal" assimilation and utilization, to be specific?

Too often the term, normal, is loosely used to indicate today's or yesterday's average, which may or may not be normal. Again, we have often considered as *normal* assimilation, that which permits maximum retention or maximum absorption, if the mineral is one not stored in any quantity. Such a definition has had violent opposition in certain quarters, and enthusiastic support in others. In the present state of our ignorance it seems reasonable to assume that, in the case of those minerals for which the body has definite storage facilities, adequate nutrition implies keeping these storage depots adequately filled. Good storage seems especially desirable for those minerals which at best are absorbed with some difficulty, and which not only are not easily absorbed but may be lost from the body in the presence of even minor illnesses. Calcium and iron come under this category. Other minerals such as sodium, potassium, and chloride are always present in ample quantities in the food, are readily absorbed, so need rarely be considered except in severe illness. Excess of these is promptly and readily excreted by the normal kidney. Some minerals, as fluorine, appear to be necessary in small amount, but toxic in excess. For such, excessive intake or storage is definitely to be avoided.

STUDY OF SOIL MINERALS IN RELATION TO MINERAL CONTENT OF FOOD PLANTS

For many years we have been concerned with mineral metabolism, which has been studied very largely by the slow and expensive process of determining actual retention of minerals by individuals of different ages and nutritional states. We have known that foods vary in their mineral content and that samples of the actual diet eaten must be analyzed to obtain correct intake values for any given mineral. We have not been sufficiently concerned with the reasons why a given food should show such variation in mineral content. Recently, interest has been much stimulated by reports of the correlation of the mineral content of a soil with that of plants grown on that soil and with human nutrition in that area. For many years agricultural chemists have been concerned with the question of soil deficiencies in relation to specific diseases of stock but only recently have we been concerned about soil deficiency in relation to human nutrition. A case in point is the excellent study of Abbott and her collaborators in Florida (2). For years the high incidence of anemia among Florida children had been believed to be due to hookworm. A careful study, however, showed that the incidence of nutritional anemia did not correlate with the incidence of hookworm, but that anemia was prevalent in the same counties of the state as those in which the disease known as "salt-sick" in cattle prevailed. This disease had, of course, been studied and was known to be due to iron deficiency. Soils in many parts of Florida and the east coast states are extremely deficient in iron. The plants grown on these soils, therefore, contain very little iron. As the people of these regions ate little meat and were dependent on locally raised foods, iron deficiency was inevitable.

It remains for those of us interested in human nutrition to follow the lead of those concerned with animal nutrition if we are to determine what other groups of our population are suffering from mineral deficiencies due primarily to deficiency of the soil.

It seems greatly to our discredit that such studies as these have been neglected so long, in view of the well-known effects of soil deficiency on animal nutrition and particularly in view of the fact that the effect on human nutrition of deficiency of iodine in soil and soil water has been known for many years.

The old question of the relative effect of hard waters on nutrition should be re-investigated. For example, although the amount of calcium in hard water does not permit any notable increase in calcium intake from the water ingested as such, the calcium content of vegetables and other food plants grown on soils where the ground water is hard may be greater than that of plants grown in other areas. A slightly greater calcium content of each food might result in significant increase in total intake.

It cannot be assumed, however, that soil deficiency causing diseases of stock will always cause human deficiency diseases. Another mineral known to be deficient in certain soils is cobalt. Cobalt has been shown to be essential for normal nutrition of certain farm animals, notably sheep, but it appears at present that the human need, if any, for cobalt must be very small. So far no studies proving that cobalt deficiency exists in humans have been reported.

A second relationship of soil minerals to human health is concerned not with soil deficiency, but with the presence in the soil of minerals toxic to humans. Selenium, when present in soil, is known to be concentrated by certain plants grown on that soil. The amount of selenium in these plants is sufficient to be toxic to domestic animals and there is reason

to believe, according to Maynard (3), that the chronic ill health of the people of one section of Mexico may be due to selenium poisoning. Similar soil conditions may be found in other parts of the world.

Many students of nutrition are concerned over the effect on human nutrition of the quantities of arsenic and lead now finding their way into the soils of orchards through the use of tree sprays. The soil content of these toxic substances is continually increasing—will the fruit eventually show an increased content? What of other plants grown on such soils? Which food plants, if any, tend to concentrate these elements to any marked degree? Investigations in this entire field have only begun, but in the next few years should yield very informative results.

STUDY OF INTERMEDIARY METABOLISM BY MEANS OF RADIOACTIVE ELEMENTS

Another and far different field of investigation already has yielded spectacular results in solving the problems of intermediary metabolism of minerals. These studies involve the use of radioactive and other isotopes as "tracers," by means of which the path of an element may be studied through its entire intermediary metabolism. The body cannot distinguish between isotopes, so the marked atoms follow the normal course of the element. The isotopes may be given in amounts so small that the radiations can have no deleterious effect, yet these minute amounts admit of accurate determination. This use of radioactive elements in the study of metabolism was initiated by von Hevesy (4) of Copenhagen and has already yielded amazing results. With the rapid increase in the number of cyclotrons being built in this country, the amounts of radioactive isotopes available for use in such studies will soon permit even more rapid development of knowledge in this field.

Radioactive phosphorus has been used in the study of bone and tooth metabolism by von Hevesy and in this country by Greenberg, Armstrong, Hodge, and others. Radioactive calcium has been used to a lesser extent. The results of these studies have shown that absorbed phosphorus is quickly taken up by the organic compounds of the body. Apparently it is transferred more slowly from the organic to the inorganic compounds, but eventually the major quantity finds its way into bone and tooth substance. In epiphysial bone, where mineral deposition is more rapid than in older bone, some radioactive phosphorus is deposited within a short time after it is fed. When radioactive phosphorus is given at such a rate as to maintain a constant concentration in plasma, the "turnover" of individual atoms making up the mineral of bones and teeth may be measured. Such a study by von Hevesy (4) showed that in frogs and in rabbits 29 per cent of the total phosphorus of epiphysial bone had been renewed in 50 days, but only 7 per cent of the denser diaphyseal bone. Dentine appears to resemble diaphyseal bone in the rate at which it picks up radioactive phosphorus. Radioactive phosphorus given to rats was found deposited not only in that section of the incisors being laid down at the time, but also in the tip of the incisor, to which it must have been carried by the lymph circulation. In molars a less pronounced, but easily measurable turnover of phosphorus occurred. It has been estimated by von Hevesy that the specific activity (or interchange of radiophosphorus with that of body fluids) of total tooth phosphorus was about one-tenth that of rib phosphorus. The exchange of radio and inert phosphorus in enamel, while definite, was very small. Greenberg's study of an adolescent girl with late rickets, using radioactive phosphorus, showed that within 12 days recognizable amounts of radioactive phosphorus had been deposited in tooth substance. According to von Hevesy and Armstrong (5), a slow exchange of radiophosphorus with inert phosphorus of the enamel occurs, but is so slow that it does not indicate any ability of the enamel to undergo significant changes of composition after eruption, as a result of nutritional alterations. The exchange of radiophosphorus in dentine is more marked.

These studies have demonstrated completely that all tissues, even the most inert, like bone, dentine, and even the dense highly mineralized enamel, are still living and metabolizing tissues, and that an individual atom, once deposited in the structure, does not remain in that position during the remainder of the individual's life.

Studies of radioactive calcium, fed with and without vitamin D, have demonstrated that vitamin D increases the absorption of calcium and phosphorus from the intestine. These findings confirm those of older studies wherein other techniques were used.

The study of intermediary metabolism of iron has been illuminated by the use of radioactive iron. Hahn (6) and his associates at Rochester, particularly, have made important contributions in this field. Following the Rochester technique these investigators have fed dogs a standard iron-low diet and made the animals anemic by repeated bleeding. Normal dogs have been used for control. The results of these studies have a very direct bearing on iron nutrition and may be summarized as follows:

Iron fed by mouth is never wholly utilized, even when given in very small amounts. As the amount fed increases, the percentage utilization decreases. The maximum absorption was about 35 per cent of a 2-mg. dose; the minimum, about 5 per cent of a 200-mg. dose given a 20-kg. dog. An animal whose hemoglobin is normal and whose iron stores are full, does not absorb appreciable iron. The amount of

iron absorbed depends upon the need. Even in deficient animals, however, the form in which the iron was fed made very little difference in its utilization. Organic iron, ferrous and ferric iron were equally well utilized. These latter findings are in harmony with those of investigators studying iron metabolism of infants (7) but contrary to much of the older work. It would appear now that as no form of iron ingested is utilized wholly, the form in which the iron is fed is less important than the quantity fed.

In anemic animals, radioactive iron fed by mouth appeared in the hemoglobin of the circulating corpuscles within 4 hours, and within 24 hours a very appreciable increase in radioactive iron content of the hemoglobin occurred. Experiments showed that no transfer of iron occurred from plasma to corpuscles already formed, and no transfer from plasma to dissolved hemoglobin. It appears, therefore, that iron enters the molecule at a late stage in the development of the corpuscles.

The studies showed further that iron given to an anemic animal was not stored but was immediately used for hemoglobin production. An animal already producing hemoglobin at a rapid rate utilized the radioactive iron at an even more rapid rate than did the standard anemic animal.

CORRELATION WITH EARLIER STUDIES

The above findings relate directly to iron nutrition and correlate with other studies by the older methods. The finding that animals not needing iron do not absorb it corroborates the thesis advanced by McCance and Widdowson (8) that iron in the normal unencumbered adult is neither absorbed nor excreted. Retention is parallel to need and appears to be conditioned on the level of plasma iron. Need of iron is thus constant during the period of growth for males, and not only during growth, but also until the menopause in females. In women past menopause, iron need is no greater than in men, provided the woman is not iron-deficient at menopause.

Studies of storage of iron at different ages throughout life have been made (9) by analyses of storage organs from autopsy material. The period of lowest iron stores in the body occurs at about two years of age. The amount of iron stored in the liver and spleen tended to parallel the hemoglobin level in blood, decreasing from soon after birth to two years, then increasing steadily to the adult level.

Why should the lowest storage be at two years? The child of this age eats a mixed diet, which supposedly contains much more iron than the usual diet during infancy. Also the rate of growth is not so great as during infancy. Both these factors would be expected to increase iron storage and hemoglobin level. Metabolism studies of children one to three years of age are few, for obvious reasons. It appears probable that depletion of iron reserves occurs during infancy, and the iron intake of early childhood barely suffices for maintenance. Further study of this age group is desirable. As children grow older the per kilogram iron requirement appears to decrease (10), compared with the requirement of infants. The iron requirement of girls during adolescence needs to be determined more accurately. While anemia of adolescent girls is neither so common nor so severe as it used to be, it is still too prevalent. It seems probable that the two-year-old and the fourteen-year-old need more iron than is usually ingested, and that the average adult male could get along with less.

CONCLUSIONS

In conclusion, it is to be emphasized that good nutrition means good utilization of an ample diet, and that poor utilization is possible and does occur in apparently normal individuals.

The study of soil minerals in relation to the mineral content of food plants, and the study of intermediary metabolism by means of radioactive elements, are two of the more recent fields of investigation in the study of mineral metabolism.

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Food Allergy[1]

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THE term, allergy, meaning literally "altered reactivity," is defined by von Pirquet, its originator (1906), as a "changed reaction capacity which the human or animal organism gains through recovery from disease or through treatment with foreign substances." This implies the establishment of a definite immunologic mechanism which becomes an additional and permanent attribute. This denotation has now been broadened to describe all forms of altered tissue reactivity without regard to the immunologic mechanism involved and at present is used to indicate the abnormal reactions manifested by certain individuals towards certain substances (or allergens) or physical agents which are harmless to the majority of individuals.

These abnormal reactions, which may occur anywhere in the body, are local tissue reactions probably due to irritating physico-chemical changes that are the result of a union of individual allergen with specific allergic antibodies attached to the body cells. This reaction induces capillary dilatation and permeability leading to various degrees of edema, associated with smooth muscle spasm and eosinophilic infiltration. Thus, edema of the nasal tissues is present in hay fever and perennial vasomotor rhinitis, of the bronchi in bronchial asthma, of the brain in migraine, of different layers of the skin in urticaria, angioedema, and dermatitis, and of the intestines in allergic manifestations in the gastrointestinal tract. In some of these it has been possible to delineate smooth muscle spasm as well; whether this is the result of irritation and secondary reflex spasm, or is a primary reaction, is a question to be determined by future investigation. It is the opinion of some that this mechanism is an enhancement of a normal physiological response which probably exists in all people and is not necessarily a pathologic condition.

Experimental observations indicate that for the present we may assume that when the allergen comes in contact with its specific antibody present in the cell, a histamin-like substance (H substance) is released which causes dilatation and increased permeability of the capillaries, smooth muscle spasm and eosinophilia. One infers that if the stimulus is mild the manifestation remains local and that with greater antigenic stimulation, sufficient H substance may be liberated to activate distant tissues, resulting in widespread and polymorphic symptoms or even anaphylactic shock. Experimental evidence also indicates that acetylcholine is responsible for the release of H substance. However, these experimental observations at present are merely speculative, for the clinical manifestations of allergy cannot be entirely explained on the basis of reaction to histamin or a histamin-like substance.

Given the capacity for sensitization, the allergen reaches these tissues either by direct contact or through the blood stream, so that the presenting symptom is caused either by direct contact with the allergen, or to its inhalation, ingestion, parenteral injection, or from a focus of infection. For example, allergic vasomotor rhinitis may occur through direct contact of the nasal mucosa with pollen, or after the ingestion of a food or an injection of a solution during the therapeutic process of hyposensitization. These abnormal reactions are more likely to occur in individuals who are characterized by the following:

(1) In over one-half of such individuals there is an inherited capacity for such sensitization; generally, however, the specific hypersensitiveness is not transmitted. The parent with asthma due to feathers may have one child with migraine due to chocolate and another child with vasomotor rhinitis due to pollen. Of great practical importance is the fact that children may be extremely hypersensitive, yet have no discoverable traits in their antecedents; again, there may be children who escape hypersensitiveness, whose antecedents undoubtedly had diseases allergic in origin.

(2) The allergic individual may have more than one clinical allergic manifestation, *i.e.* asthma and hay fever, or asthma and eczema, eczema and migraine, or purpura and urticaria may follow one another or occur at the same time. Commonly, the clinical history is that of eczema during infancy, hay fever during early adulthood, and asthma in later adult life. Such transmutation of symptoms is typical.

(3) The allergic individual has an increase of eosinophils, in the blood, in the reacting tissues, or in the secretions.

(4) The allergic individual, moreover, is one in whom it is usually possible to elicit a characteristic cutaneous reaction. In most instances the substances responsible for

[1] Presented before the American Dietetic Association, St. Louis, October 21, 1941.

the symptoms will produce an itching wheal with a halo of erythema, when placed either upon a small cut in the surface of the skin or injected intracutaneously. It is of practical importance to know that there are individuals who undoubtedly have afflictions due to hypersensitiveness, yet do not show a cutaneous reaction to either of these tests.

(5) And finally, the allergic individual is one who is chronically ill but seldom dying from his affliction—a high morbidity with a low mortality.

By food allergy is meant the symptoms resulting from the absorption of foodstuffs. They result from the ingestion (occasionally the inhalation) of foods to which a specific hypersensitiveness exists. The symptoms are dependent upon the location of the sensitized tissue and may be either respiratory, dermatologic, gastro-intestinal, or meningeal.

BRONCHIAL ASTHMA AND VASOMOTOR RHINITIS

Bronchial asthma was the first affliction to be studied intensively by clinicians with allergy in mind. As a result, bronchial asthma can be divided into two broad classes: allergic, in which specific sensitization can be proved; and non-allergic, in which no specific factor can be discovered despite clinical resemblance to the allergic group. From the standpoint of etiology it has been convenient and helpful to divide allergic bronchial asthma into seasonal and non-seasonal types. Pollen, seasonal foods and seasonal environmental contacts are the more frequent causes for the former; while feathers and other animal danders, orris root, house dust, cottonseed, and wool, among the inhalants, and wheat, egg, milk, chocolate, fish, chicken, pork, nuts, spices, condiments, fresh fruit, and legumes, among foods, are the most frequent causes for the latter. While inhalants are the most frequent etiologic agents, when considering all cases, food is more likely to be the offending factor in infancy and early childhood and there are some instances where it is the dominant factor later in life. It is also an accessory factor in many instances where the asthma is primarily due to an inhalant. Skin tests are positive and diagnostic in about 50 per cent of instances. Of practical importance, however, is the observation that improvement may follow a change of or *in* the environment, or the removal of the suspected foods from the diet in patients who fail to give positive cutaneous reactions.

Allergic vasomotor rhinitis is more often due to inhalants than ingestants. The dominant etiologic factor in the annual or seasonal type (hay fever) is air-borne pollen of trees, grasses, and weeds; in the perennial or non-seasonal type it is an inhalant other than pollen, such as animal epithelia, orris root, cottonseed, house dust, and occupational dusts. When foods induce symptoms they are ancillary to inhalant hypersensitivity with the exception of a small percentage of perennial cases in which food is the dominant cause. In the seasonal form (hay fever), wheat, egg, beans, chocolate, milk, corn, fish, nuts, and melons are the most frequent accessory causes. There are some who are subject to seasonal vasomotor rhinitis (hay fever) whose symptoms are alleviated or completely controlled only when dietary restrictions supplement the hyposensitization injections. In some of such instances, the foods excluded do not produce symptoms at other times of the year and a few cases are made comfortable by diet alone. In the non-seasonal or perennial form, wheat, egg, milk, and chocolate are the most frequent contributive or dominant factors.

ALLERGIC DERMATITIS

In the past the term eczema designated a heterogenous group of skin conditions. At present it should not denote a diagnosis but merely indicate a temporary name for itching, papulovesicular inflammatory conditions and scaling erythematous lesions of the skin, all of which await classification. By determining definite etiologic agents, the concept of allergy has clarified this syndrome and one employs the term allergic dermatitis to indicate those syndromes in which allergy is of etiologic importance. Until more is known about the subject there can be no satisfactory classification, but for a working basis one can classify the allergic dermatoses as atopic dermatitis or atopic eczema, and allergic dermatitis of the contact or eczematous contact type of dermatitis (the word "eczema" is retained solely because of popular usage).

Atopic dermatitis is also known as neurodermatitis, atopic eczema, allergic eczema, generalized neurodermite (Brocq), Besnier's prurigo, lichen *chronicus simplex disseminatus* (Vidal), late exudative eczematoid (Rost), pruritus with lichenification, or flexural eczema, and is due to sensitization by hematogenous or internal agents with the primary lesion in the upper corium. It is characterized by a particular tendency to a familial occurrence, and by sensitivity to water-soluble etiologic agents which give transitory wheals and erythema in 5 to 30 minutes by intra or percutaneous testing. In infancy and early childhood, food is the more frequent cause; in later life, it is usually associated with inhalant and not infrequently with fungus hypersensitivity. Cutaneous tests are positive and diagnostic in about 50 per cent of uncomplicated cases. When the dermatosis is associated with seasonal vasomotor rhinitis or bronchial asthma, the tests are positive in about 80 per cent of the cases and usually to several allergens.

The principal causes of atopic dermatitis are egg, milk, and wheat among the foods, especially in infants and young children, and silk, orris root, feathers, and perhaps pollen among the inhalants. Experimental removal of egg, wheat, and cow's

milk from the diet will benefit many, but not all with negative cutaneous reactions. The dietetic diary will detect other foods which should be experimentally removed from the diet.

Allergic dermatitis or the eczematous type of contact dermatitis, contact dermatitis, dermatitis venenata, eczematous or occupational dermatitis, is due to sensitization by contactant or external agents with the primary lesion in the epidermis, and is characterized by no particular tendency to familial occurrence and by the fact that simple chemicals soluble in water, in fat solvents, or in vegetable oils may be causative agents and produce a papulovesicular erythematous lesion in 24 to 48 or more hours on surface contact by means of patch tests. The excitants are countless and include chemicals, drugs, dyes, dusts, and plant oils. Hypersensitivity to foods may complicate apparently clear-cut cases of allergic dermatitis, so that a therapeutic effect is obtained only after avoiding both the contactant and the ingestant factors.

URTICARIA AND MIGRAINE

The specificity of the urticarial wheal of the cutaneous test in diagnosing some allergic conditions and the certainty with which urticaria can be induced by the second injection of horse serum have led to the belief that all urticaria was the result of a similar mechanism. While this conception has aided in determining the etiologic agent in some instances, nevertheless chronic generalized urticaria remains one of the most difficult clinical problems. It is simplified by considering urticaria as a symptom of many diseases, and not an unquestioned manifestation of the allergic state.

The offending food or drug can often be surmised from a painstaking and discriminative clinical history, and a scrupulously accurate dietetic diary is of great assistance. Acute generalized outbreaks, repeated at intervals, are usually due to food infrequently eaten and often known to the patient, but are also due to substances absorbed by the respiratory tract (feathers, orris root, animal dander, dusts) and distributed by the blood stream, or to contact with silk, wool, dyed materials, cosmetic preparations, or to physical agents (heat, cold, light) and perhaps infections.

Focal infection appears more frequently as the cause of chronic generalized urticaria, although, in the occasional case, foods or drugs are the only cause. In some cases the relationship between food and the urticaria is definite. The urticaria definitely disappears upon abstinence from a specific food, to recur promptly when the food is again eaten. In others, because of the analogy to serum sickness, this relationship is surmised rather than proved. In these, the outbreak may occur a day or two after eating the food, or the urticaria may appear only after eating an excessive amount of the food at one meal or a moderate amount over several sequential days. In some, while the outbreak occurs following the ingestion of specific foods, the attack is prolonged for days. There are also instances in which urticaria disappears in patients on a restricted diet, leading to the assumption that one of the excluded foods caused the urticaria but does not recur upon returning to the usual diet. Such clinical occurrences make us doubt that foods are the specific cause. Skin tests as a rule do not disclose the etiologic agents. Positive reactions are often obtained to allergens which appear to be unrelated to the urticaria, and any food has the capability of causing urticaria in the susceptible individual. Statistically, egg, wheat, milk, potato, citrus fruits, and pork are the more frequent causes in the chronic type; seasonal fruits, shell fish, and drugs are most evident in the acute cases.

Allergy should be considered as the probable factor for recurrent headache (1) or typical migraine (2) when such patients have other allergic manifestations and have antecedents either with allergic diseases or with similar headache, one or both. Egg, milk, chocolate, onion, wheat, potato, and beef more frequently cause these headaches, but any food may be the etiologic agent. Occasionally, inhalants, most often orris root or feathers, are the cause. Cutaneous tests are positive in the majority of cases but are not always diagnostic. In those with negative cutaneous reactions, trial diets are helpful either as elimination diets or as corrective diets in those with bad dietary habits.

GASTRO-INTESTINAL DISTURBANCES ATTRIBUTED TO ALLERGY

Gastro-intestinal symptoms on an allergic basis fall into two classifications: gastro-intestinal disturbances occurring in patients with other manifestations of allergy; and those occurring in patients without other allergic manifestations. Since allergy produces edema and smooth muscle spasm, and since this reaction may occur anywhere throughout the length of the gastro-intestinal tract, as influenced by its normal or perhaps pathological physiology, the manifestations, of necessity, will be variable. These include canker sores, various degrees of epigastric discomfort ranging from mild pain to that simulating the ulcer type, abdominal discomfort, generalized or simulating gallbladder or appendiceal pain, diarrhea, spastic constipation, pruritus ani, mucous colitis, and cyclic vomiting. Rarely, there is an acute response characterized by nausea, vomiting, diarrhea (sometimes bloody), severe pain, often urticaria terminating occasionally with circulatory collapse and even death within a few minutes or hours after eating the allergenic food.

Egg, milk, wheat, onion, spices, condiments, and uncooked fruits are the more frequent causative

foods, with any other food possessing the potentiality of inducing symptoms. These are indicated by the cutaneous tests in about one-half of the cases. In cases in which other allergic manifestations have been or are present, the percentage of positive cutaneous reactions is higher, but their etiologic significance is often unrelated to the gastro-intestinal symptoms. The dietetic diary must be interpreted with unusual care because all symptoms referable to the gastro-intestinal tract which follow ingestion, even in an allergic individual, are not due to allergy. Prejudice against certain foods often determines their ability to cause symptoms, and dislike for certain foods is more often due to distaste or fear of the significance of the attendant symptoms of indigestibility rather than to an unconscious defensive mechanism against the allergic reaction. The relation of these aversions to food allergy is illuminated by their incompatibility with the present theories relating to the clinical application of the allergic reaction. In the absence of demonstrable organic diseases, symptoms thought to be due to an allergic reaction may actually be due to the ingestion of direct irritants to the stomach or the intestines, to chemical or drug-like substances contained in vegetables and fruits, to a diet containing an excess of carbohydrates, or of indigestible cellulose, or of fat, or to abnormalities of the intestinal juices and ferments, or to diseases elsewhere in the body. The diagnosis in all instances must be uncompromisingly and rigorously differential in character.

DIAGNOSIS OF FOOD ALLERGIES

Food allergy is suspected from the clinical history; confirmatory evidence is evolved by the cutaneous tests, the dietetic diary, and trial diets, but the proof of its existence is furnished by the patient who notes the absence or the recurrence of the complaint following the withdrawal or deliberate addition of the suspected foods. If we bear in mind certain specific, secondary aggravating factors, such proof is relatively easy in vasomotor rhinitis, bronchial asthma, urticaria, and dermatitis, because these present objective symptoms. It is much more difficult in gastro-intestinal manifestations and headache where the symptoms may be wholly subjective and associated with a different group of secondary aggravating factors.

In the beginning, the logical procedure was to remove only the foods which gave positive cutaneous reactions. With increasing clinical experience it was found that strict adherence to this procedure did not bring about complete alleviation of symptoms. Coincidentally, experience with allergic individuals showed that they may be undoubtedly hypersensitive, yet give no positive cutaneous reactions. For these it was inevitable that trial diets would be developed. As a basis for procedure, these diets were made up to exclude those foods which reacted most frequently in patients who gave positive cutaneous reactions, on the presumption that these foods would most likely be the offending substance in individuals who gave no positive cutaneous reactions. Thus, wheat, egg, milk, potato, pork, fish, onion, spices, condiments, chocolate, nuts, apple, banana, orange, celery, cabbage and cauliflower were routinely excluded from the dietary, and by limiting the diet to a few foods the laborious and vexing method of trial and error was simplified and a more or less standardized method of treatment begun. Later the problem of devising trial diets was complicated by the observation (2) that some patients were clinically sensitive to foods biologically related. It then became necessary to observe the effect of eating all types of beans, peanuts, or lentils upon a skin sensitive only to peas; again, in the patient sensitive only to apples, one needed to observe whether allergic symptoms followed the ingestion of pears. The ideal trial diet, therefore, is one consisting of biologically unrelated foods which are infrequent causes of allergic symptoms.

DIETARY TREATMENT

Before trial diets are begun, one should have a detailed history of the customary diet, in which are related the amount and kinds of food eaten throughout a lifetime and the changes that have occurred from time to time. A correlation of such analyses with clinical investigation might suggest the etiologic factor or factors or a method which has to do with the development of food allergy. In our own experience such correlation has shown that the foods eaten to excess are frequently found to be allergic factors. Certainly such an analysis will indicate how the physical condition of individuals may be bettered by changes in the diet other than, or in addition to, those necessitated by hypersensitivity.

Trial diets should be used with circumspection and forethought. We are not treating *allergy*, but a patient with allergy. We should weigh the torment of the complaint against the stringency or impracticability of the diet for that particular patient, plus its possibly detrimental effects. In general, it is unwise to place undernourished patients on diets which prohibit the foods essential to adequate nutrition; indeed, we occasionally find that such patients improve with a high-caloric, high-vitamin diet without reference to their skin reactions. It is safer to place the obese on trial diets, and those who conform to the accepted standards for their age and sex should not be allowed to vary from that standard.

Trial diets should be used for patients whose symptoms are more or less constant, either as one or as alternating allergic manifestations, for example,

chronic bronchial asthma, frequently recurring urticaria, migraine, or vasomotor rhinitis. If such symptoms are due to food they are probably due to a food eaten frequently. If they occur at irregular intervals and are due to food, more than likely they are attributable to a food eaten only at those times.

Statistical study of allergic problems, as related to foods, is difficult and often of little help because every case is an individual problem. "Elimination diets" are merely methods of procedure for the average chronic case of allergic manifestations and the exclusion of any food from the diet of such an individual can properly be called a trial diet. It cannot be too strongly emphasized that the dietetic management in allergic disease is strictly an individual matter, and that general directions based on the response of the average patient will benefit only the average patient.

The dietetic diary should record everything that enters the mouth, and its time relationship to the symptoms. The diary should detail the quantity, method of preparation, and ingredients of food mixtures, and place of eating. It should be begun a week or more before the trial diet is started so that, together with the routine analysis of the usual diet, one may become acquainted with the shortcomings of the patient's regular diet. It is continued throughout the period of trial diets to detect the unwitting or surreptitious use of prohibited foods and to observe their effect upon the patient, to determine which foods in the trial diet appear to have induced symptoms, and to ascertain whether a sufficient amount of the diet is being consumed to maintain nutrition.

CONCLUSION

In conclusion, I would point out that, by stressing idiosyncrasy, food allergy has given a reason for the frequent failure of ready-made dietary formulae and has shown that each diet should be planned to meet individual needs. The dietitian with her special knowledge can give estimable aid in formulating such diets.

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Feeding Our Flyers

No one has yet ventured to describe the ideal diet for flying personnel. Armstrong, in *Principles and Practice of Aviation Medicine*, 1939, says: "Concerning diet, the average pilot may safely be left to his own discretion as long as his food agrees with him and is of such a nature as is generally accepted as being wholesome and correct in amount." Night blindness is a relatively common defect, especially in older pilots, and is corrected by administration of adequate amounts of vitamin A which is often found to be deficient in apparently adequate diets. The vitamin requirements of pilots are otherwise identical with other soldiers.

Air sickness is similar to sea sickness, car sickness, etc., and will disqualify an applicant for aviation training. However in warfare large numbers other than pilots travel by air. Fear of air sickness is more often a causative factor than fear of flying. Diet plays a major role in the control of symptoms. One should avoid overindulgence in any form, overloaded stomach, empty stomach, greasy foods, pastries and sweets, condiments, highly seasoned foods, etc. A light, bland meal an hour or so before flight is advised, with liquids restricted for several hours before and avoided entirely during period of illness. Many drugs have been studied but none found satisfactory.

The possibility of noise being a factor in lowering the efficiency of aviators through its effect on volume of gastric juice and acid secretions may be counteracted both by the type of food and the amount consumed.

In high altitude flying, the effect of anoxia upon gastric motility, gastro-intestinal permeability, absorption of water, salt, glucose, the sulfate radical, amino-acids, and glucosides, gastric and intestinal secretions, appetite, and hunger, all under varying physical and environmental conditions, are being investigated, and all are found to be affected in varying degrees.—*Abstract of a paper by Captain Carlton W. Winsor, Chief Surgeon, Medical Corps, Wright Field, Dayton, Ohio, before the Ohio Dietetic Association, Columbus, November, 1941.*

The Dietitian as a Teacher of Dental Students[1]

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IN THE earliest days of nutrition work the American Dietetic Association undertook an analysis of the functions of the nutritionist in the fields of public health and social welfare. To the committee which tabulated the data from the questionnaires, a surprising fact was revealed: namely, that the nutritionist was first and foremost a teacher, with the community as her classroom.

Since the period of this discovery, the nutrition worker has become increasingly aware of her pedagogical responsibilities. Apparently with eagerness —but it may have been only with resignation—she has courted opportunities to increase the number and diversity of her pupils. The hospital dietitian, engrossed primarily in activities of an administrative nature, is possibly less likely to regard herself as a teacher; but the theme of this session attests the growing interest of all members of the Association in the opportunities for instruction which are at hand.

The entire question of nutrition education in dental schools has received the thoughtful consideration of the Professional Education Section of this Association as indicated in its published report (1). An added impetus to nutritional training for the dentist now comes from two directions. First, there is the growing conviction that if dentistry is to discharge its full responsibilities, it must have a greater regard for the optimal functioning of the body as a whole; that it must be less completely engrossed with skill in repair and construction and more concerned with the biological aspects of the science.

The second stimulus to nutritional emphasis is obviously the critical nature of our times. All needs related to the health of the nation become more sharply focused against the background of the present emergency.

The National Nutrition Conference for Defense has made specific statements with respect to the inadequacies of our present methods of teaching nutrition to dental students (2). It has also formulated clear-cut suggestions for strengthening the courses of the future. Foremost is the recommendation that sufficient training be given not only in the basic sciences but also in the application of nutrition knowledge, with due attention to the economic, social, and psychological aspects. Emphasis is placed on the desirability of practical work with family food problems, and of experiences in discovering nutritional needs and developing plans to meet them. The establishment of nutrition clinics in association with professional schools is strongly recommended.

PROVIDING PRACTICAL NUTRITION EXPERIENCE FOR DENTAL INTERNS

It is in precisely this field of practical work for the dentist that the Nutrition Department of the Forsyth Dental Infirmary for Children has long been engaged. Our objective has been to help the intern to translate his undergraduate courses in the physiological and biochemical principles of nutrition into terms of everyday knowledge for himself and his patients.

Each year, from twenty-five to thirty newly-graduated dentists become interns at the Infirmary, which is an outpatient clinic for children under fourteen years of age. Since the practice is to select only one candidate from a single dental school, a wide geographical representation is customary. The group this year, for example, is composed of twenty-six interns who represent twenty-two dental schools in fourteen states, Canada, China, and Syria. The internship provides extensive clinical experience in all phases of operative dentistry for children and observation in each of the various departments of the Infirmary; but those who determine the policies of the institution hope that above all it will help the dentist to become aware of many of the broader implications of his work. The internship is designed to cultivate attitudes and awaken interests that reach far beyond the immediate procedures of the dental clinic.

The nutrition program is carried on partially

[1] Read before a special session of the American Dietetic Association on "The Dietitian as a Teacher," St. Louis, October 22, 1941.

through the classes which are held four mornings each week. Here, research activities in the following fields are discussed by visiting lecturers: the pattern of human growth and the individual differences therein; the chemistry and physiology of the vitamins; pathological changes resulting from vitamin deficiencies; mineral metabolism; the role of vitamins and endocrines in tooth formation and maintenance; the effect of emotional disturbances on digestive processes; and laboratory and clinical research in the dental-nutrition field. In addition, other topics closely related to nutrition teaching, such as the place of health education in the dental program, are considered.

The responsibility of the nutritionist is to discuss the practical significance of this research as applied to the dental patient, both the clinic child of today and the private patient of tomorrow. Her classes with the interns, therefore, are devoted to the consideration of specific problems of human nutrition.

As introductory material, the scope of nutrition as a national problem is indicated. Next, the dietary needs of the interns themselves are reviewed, and the contributions which the various groups of foods make to these needs are shown graphically by means of a colorful teaching device. While the relation of nutrition to dental conditions, which is the primary interest of the interns, must be kept in focus throughout the course, attention is consistently directed to the nutritional well-being of the body as a whole. Full consideration is given to dietary requirements during the developmental periods of the teeth; namely, during pregnancy, lactation, infancy, and childhood, although a discussion of the needs and problems of other than the foregoing, *i.e.* the adult dental patient, is also included. Good nutritional practices within the family unit, such as economical buying, careful storage and preparation of food, and skilful child management with respect to eating habits are considered.

Every attempt is made to present nutrition as a living, rapidly expanding subject with human implications that are legion. Probably the major strength of the course lies in the wealth of clinic data which are at hand to enliven the teaching. In the selection of the case material, preference is given to the records of children whom the interns themselves have referred to the Nutrition Department.

Visual aids are used for each class hour. Illustrative material such as enlarged diagrams showing the calcification periods of the teeth, posters depicting relative food values, and charts presenting the findings of clinical studies add variety and interest to the period.

Following each talk, reprints and references for collateral reading are displayed on a bulletin board maintained by the Nutrition Department in a conspicuous position in the dental clinic. The material covers a wide range and is changed once a week throughout the year. Journals, reference pamphlets, reports of meetings, posters, teaching charts, and popular leaflets for lay groups are displayed. The bulletin board has three functions: it offers reading to supplement the class work in nutrition; it directs attention to the many sources of authentic nutrition information; and it serves as the medium through which orders for material are placed. Many interns assemble a substantial number of pamphlets which they later find useful as reference material and as a means of interesting their patients in nutrition.

Another teaching activity of the nutritionist is associated with a clinic in which medical-nutritional supervision of individual patients is maintained by means of periodic conferences with the mother and child. Attendance at this clinic is perhaps the most popular phase of the nutrition work for the intern. Assigned in rotation, each observes and shares in a practical educational program which aims to improve dental conditions and promote general health.

During his period in the clinic, the dentist becomes aware of many factors in the complex problem of dental caries. First he studies the preliminary history of each child which acquaints him with the racial, social, economic, and general health status of the family and gives detailed information with respect to the prenatal, neonatal, and infancy periods. Next he sees the pediatrician's appraisal of the child's physical condition. And finally he participates in the discussion of the present diet and habits of living, and in the nutrition teaching which follows.

This experience gives the intern direct contact with many aspects of nutrition work. He learns to appreciate, for example, the painstaking techniques by which meaningful histories are obtained. He becomes aware of the prevalence of inadequate dietaries among the clinic families and of the social, economic, and emotional factors which are interwoven with nutritional problems. He observes the personalized approach to mothers and children and the varied methods by which interest in nutrition can be aroused and sustained.

The referral of patients and the subsequent case conferences with the nutritionist constitute another important phase of the work. Interns are encouraged to refer children to the Medical-Nutrition Department and are given wide latitude as to the reasons for their selection. The majority of patients are referred on the basis of dental pathology, such as extensive caries, premature loss of deciduous teeth, or hypertrophied gingivae. A child with exceptionally good dentition, on the other hand, is often selected because the intern wishes the opportunity to study the case history. Another group of patients is referred because their general appearance

suggests to the dentist the desirability of a medical examination and nutritional guidance. The interns are encouraged to attempt to appraise the physical and nutritional state of the patient while carrying on their operative work.

Whenever possible, the intern is present during the medical examination and nutrition conference of the children whom he has referred; but because of the operative schedule of the dental clinic, this arrangement cannot always be made. As a substitute measure, the nutritionist reserves one hour each week for case conferences with the dentists.

At this time the intern reads the records of any children originally referred by him who have recently attended the medical-nutrition clinic. If the case is a new one, he studies carefully the preliminary history, the pediatrician's comments, and recommendations for further medical care. From the nutrition record he learns of the habits of purchasing and preparing food for the family; menu planning; food expenditures; the child's customary level of consumption of the various food groups; meal spacing; and the dietary preferences and prejudices of the child and other members of the household. Information is also available on many other factors related to nutrition, such as habits of sleep and rest, activity, recreation, elimination, family relationships, social adjustments, and progress in school. Finally, the intern reads and discusses with the nutritionist the recommendations that have been made and the general plan for the nutritional guidance of the family.

Frequently the dentist retains as a patient the child whom he has referred for nutritional supervision. If so, he supplements his record study with periodic contacts of his own; if not, he relies upon the case conferences to keep him in touch with the progress that has been made and any changes which have occurred in the dental condition. The intern thus has the opportunity to follow as many children as his interest dictates, studying the relation between the oral state and the life history of the individual.

Some of the most enterprising interns seize further opportunities for case study. This year, for example, one requested the help of the Nutrition Department in order that he might investigate the retardation or arrest of caries which often occurs in the floor of a cavity as the result of intensive dietary supervision. In the preparation of the theses that are required for completion of the internship, the records of the medical-nutrition clinic often serve as the basis for original study. An intern recently used these files in an interesting bit of research on the relation between the rate of growth and the progress of dental caries during certain periods of childhood. Independent studies of this nature, it seems to us, embody many of the desirable experiences of the learning process.

VALUE OF NUTRITION EXPERIENCE IN DENTIST'S LIFE AND WORK

To confuse fact with wishful thinking is, to be sure, a common pitfall of the teacher as he attempts to evaluate his work. Yet an honest attempt at appraisal indicates that the various activities just described make certain distinct contributions to the development of the dentist.

In the first place, there are many indications that the knowledge of nutrition functions realistically in the personal practices of the group. This fact was suggested by one of the interns from abroad who recently commented, "I eat what I don't like now, as I know some of these foods are too important to me." The effort in the direction of healthful living has been even stronger than usual during the past year, since nutritional prehabilitation of the young students at the Infirmary is considered one contribution that our department can make to defense. The majority of the interns have responsibilities in food management during their period in Boston as members of newly-established families or through cooperative schemes of apartment living. Immediate application of their knowledge is therefore possible. The two nutritionists on the staff are readily available for informal conferences with respect to personal and family dietary adjustments.

In general, the program of the Nutrition Department supplements and reinforces the previous knowledge of the interns, giving it significance in relation to their own life and work; it acquaints them, usually for the first time, with a well-established, practical program of nutrition education, in which the interrelation of dental, medical, and dietary problems is stressed; it shows the results of such a program in terms of a reduction of dental caries (3) and improved physical conditions; it helps to sharpen their perceptions and season their judgment with respect to many phases of dental practice.

The achievements of one's pupils always constitute the reward of the teacher. As instructors in dental schools, consultants in state health departments, leaders in professional organizations, or private practitioners of influence, many of our former interns report a continuance of their active interest in nutrition and cooperation with specialists in this field.

POSSIBILITIES FOR FUTURE DEVELOPMENT IN THE PROGRAM

We are fully aware of the shortcomings of our program and the directions in which it should be strengthened. Especially desirable, it seems to us, is provision of more opportunities for the dentist to carry actual responsibility in the work with parents

and children. It is interesting that this was the change most strongly recommended by the interns themselves when they answered a nutrition questionnaire at the close of the past year. Several suggested that, in order to develop proficiency and self-confidence, they be allowed to teach both individuals and groups. The chief obstacle in expanding this phase of the training is the difficulty in adjusting the time schedule of the operative clinic. It may be feasible, however, to provide additional experience for a limited number of students who show an unusual interest in and aptitude for the work.

The various activities just described acquire significance only as they relate to the whole program of nutrition training for the dentist. Considerable progress is evident in the dental schools with respect to the amount of instruction in this subject and the presentation of nutrition as an entity rather than a portion of some other course. Several members of the American Dietetic Association are making outstanding contributions to the dental curricula at both the graduate and undergraduate levels. Others will undoubtedly participate as further advances are made in the number of courses given by specialists in applied dietetics.

Another group of our members can help to further nutrition education through less formalized channels. The number of hospital internships for dentists is increasing. Although considerable variation is apparent in the training offered, the work centers around the fields of oral diagnosis, surgery, children's dentistry, orthodontics, and prosthetics (4).

Nutrition enters into each of these branches of dental service. The causes of many types of mouth lesions, for example, can be traced directly to dietary inadequacies. Nutritional preparation and post-operative care are of great benefit in oral surgery. Good nutrition promotes dental health in childhood, and aids orthodontic treatment through its stabilizing effect on the processes of growth and development. Many of the problems in prosthetics appear to stem from unfavorable dietary practices. Principles such as these may have been taught in the dental school, to be sure; but the hospital provides unique facilities for review and application.

In connection with the growth of internships, then, a question merits the thoughtful attention of the hospital dietitian. In spite of crowded schedules and intricacies of interdepartmental policies, might not more effort be placed on work with the dental student?

It is possible that this challenge can be met through a new activity, such as a series of teaching conferences on dental-nutrition problems, participation in ward rounds in which the dental intern may be included, or cooperative work with patients, including provision for frequent case discussion. The answer may, on the other hand, lie in established activities which are already available to medical and surgical interns. The dentist as well as the physician needs, for example, to work with the dietitian as she teaches, whether it be individuals or groups, normal or therapeutic diets, on the wards or in the clinic; for he, too, should learn to adapt the dietary prescription to conditions in the home and community.

The dietitian who becomes a teacher of dentists gives an allied profession an important tool. In the process, her own horizon is widened and her knowledge expanded. As acceptance of our responsibilities increases may it be said of each of us, "And gladly would she learn—and gladly teach."

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Reaching the Industrial Worker

Every type of organization in the community will be used to train people how to provide a good diet. Industrial plants can contribute in an important way to this educational program. Posters are being developed for display in cafeterias and workrooms. But education of the worker alone is insufficient. His wife decides what food will go into his lunch basket and what food will be served in his household. It is necessary, therefore, to arrange to train the wives of workers through attendance at nutrition classes and by the use of literature and posters of all kinds. Suitable inserts can be handed out with pay envelopes, although in some plants adoption of this plan is likely to lead to the suggestion that the worker's pay be increased to provide better food.—*Organization Section, J. A. M. A., 118: 8, 1942.*

Depreciation of Food Service Equipment

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A WELL-KEPT culinary department presents a tremendous appeal, denoting a spirit of thrift and attentive care on the part of those in charge. A group of young dietitians who visited the kitchen of a large tea-room recently had been led to believe, because of the generous publicity about the place, that the kitchen would be a dream of sparkling tile and stainless steel. To their surprise, they found a kitchen mellow with years of service and as quietly efficient as an old retainer. The wood-top tables were bleached by many scrubbings and the well-organized routine for care and upkeep had kept each working unit in good condition. The evidence of thrift, productiveness and painstaking care made a deep impression on the young women.

Most food service managers take pride in attractive workshops efficiently equipped and are not unaware of the factors affecting the procurement and maintenance of good equipment. They realize that adequate equipment and pleasing surroundings are effective in facilitating work and raising standards and strive to keep kitchens at their best.

Thrifty maintenance requires far-sighted plans. When the equipment is new, plans must be made for keeping it in repair and ultimately replacing it. This part of keeping the house in order usually appears in the budget under two headings. Repair or maintenance expense will be listed under operating cost, and replacement as reserve for depreciation. The latter takes on something of the aspect of long-term buying, except that the money is set aside in advance of the actual purchase and may earn interest; whereas the usual long-term buying, or deferred payment plan, calls for a service charge. The length of the buying period will depend upon the rate of depreciation of the present equipment and will vary from two or three years for china and glassware to about twenty years for certain large pieces of equipment and furniture.

The record history of kitchen equipment should be carried through from the original purchase, care, repair and upkeep to the ultimate replacement. The data should furnish answers to such questions as: What is the reasonable life expectancy for each piece? How may satisfactory service life be prolonged? What would constitute an appropriate budget allowance to cover care, repair and reserves for depreciation (or replacement)? How may the advisability of purchasing new equipment be determined?

An examination of equipment repair or depreciation records may be very enlightening. Initial costs are frequently regarded with awe, while repair or depreciation expense is tolerated in dribbling amounts that eventually total more than the price of a new piece. In one institution the records for a mixing machine showed unusual expense for parts. The machine operated satisfactorily but was of such obsolete design that parts were no longer manufactured and had to be specially made. The following records concern two steamers which required frequent replacement of gaskets as a result of faulty design. In twenty-two years of service, the gasket expense amounted to more than twice the original cost of the steamers. A dishwashing machine, once criticized by competitors as a weak model that would continually break down, was working efficiently at the end of ten years of fairly heavy daily use, while less than twelve per cent of its original cost had been spent for repairs.

The steam cookers were originally purchased for about $220 each. They were used an average of six and one-half hours each day for twenty years and were then appraised at $8.30 each. The repairs were as follows:

1919	6 lever handles	$ 3.90
1923	repairs	27.26
1923	paint	2.66
1924	repairs	13.65
1927	new door	14.36
1916–1938	new gaskets	514.96
Total recorded repairs, 1916–1938		$576.79
Average cost of gaskets per year, 1916–1938		$23.41

An automatic dishwasher and tables costing $1697 were appraised at the end of ten years as being worth

$225. The equipment was in use for five and one-quarter hours daily. The repairs were as follows:

1931	repair valve leak	$16.35
1931	repair final rinse-arm	5.75
1934	repair couplings and take play out of motor	7.35
1935	repairs	1.50
1937	new belt	33.61
	Total	$64.56

New curtains and baskets:		
1929	2 baskets	$11.50
1935	7 baskets	38.50
1936	4 baskets	29.35
1929	curtains	8.25
1931	curtains	2.30
1933	curtains	1.75
	Total	$91.65

Although a group of institutions may be similar in purpose, the situations within are rarely identical and numerous factors must be taken into consideration in determining the most suitable time for the purchasing of new items. The ideal situation is a wisely planned kitchen layout and carefully selected equipment. As time passes and replacement becomes necessary, pieces are added and the kitchen is kept up to date and in good repair. Frequently, however, the pressure of other expenses in the budget or the abnormally high cost or difficulty of obtaining an item, even in peacetime, makes the purchase unwise in the year for which it is planned. It may not be possible to make a timely purchase just because the dietitian has neglected to present her request, convincingly worded, and in sufficient time to be included as a budget item. Naturally the superior officer to whom such requisitions are presented must have strong evidence of the wisdom of such purchases, not only for his own information but also to present to a governing board.

To some people equipment depreciation is merely a phrase or an item in a profit and loss statement; while to others it means the life-span and repair cost of equipment as budget items in maintaining a satisfactory kitchen. The reason the term has such varied meanings is that dietitians have a varying degree of responsibility for the equipment used in their kitchens. Many have charge of food preparation departments that are fully equipped. When repairs are necessary, the engineer, plumber, or electrician is called in and adds the expense to his department requests, and the dietitian as a result has little or no record of this expense. In some instances the dietitian is entirely responsible for the selection and upkeep of equipment. Where this is true, a helpful procedure in making necessary replacements would be the recording of specifications and history of operation in order to facilitate future selection or to substantiate requests entailing unusually large expenditures. This information, when compiled, would be of value to every institution buyer and budget planner.

There is a scarcity of adequate records which might serve as a basis for usable averages and a fairly accurate gauge for depreciation rates in foods units of institutions and business organizations. A study with this purpose in view was attempted in 1933 by the Administration Section of the American Dietetic Association. Because of insufficient records in the institutions covered, returns from the questionnaires were too incomplete for a workable compilation. The support of dietitians in each type of institution is greatly needed in order to assemble completely informative data on this problem for future use.

Record forms should have the name of the item, date of purchase, price, description (including manufacturer, model or catalogue number, and whatever concise specification is needed for accurate designation), and a detailed account of repairs. The custom in most business organizations is to state the depreciated value and the amount of the depreciation each year. Such records faithfully kept will not only be useful for profit and loss statement and the budget but also should present a convincing argument for or against each unit of equipment. They should furnish a history of equipment and performance sufficiently comprehensive to enable the food service manager to make intelligent recommendations concerning the need, selection and operation of each unit. The following records, when compared with those of similar institutions, will furnish a basis for judging reasonable service and probable upkeep costs.

The rate of depreciation has been shown to vary considerably. The generally accepted rates per year[1] for institution kitchen equipment have been published as follows:

Equipment	*Depreciation Rate Per cent*
China and glassware	50
Dining room furniture	7
Kitchen equipment and machinery	10
Kitchen utensils	25

In a study undertaken at the University of Washington[2], kitchen machines showed a depreciation varying from 2.9 to 7.96 per cent; china and glassware about 24 per cent; silverware about 11 per cent. The depreciation was determined by the use

[1] Accountants' Handbook, second edition, p.718. Edited by W. A. Paton, New York: The Ronald Press Company, 1937.

[2] Chase, E. B.: Depreciation of food service equipment in the University of Washington Commons. Master's thesis, 1939.

of figures obtained from inventory cards which gave the purchase price and upkeep expense, plus the appraised value as stated by representatives from three prominent Seattle equipment houses.

There are several factors which have a definite bearing on the depreciation rate. The quality of the equipment selected is a weighty factor, for it is reasonable to expect that a machine of the most sturdy materials and of carefully machined, smooth-running parts will last longer than one of lighter weight, less durable metal and poor design. The amount of daily use or hours of service also has a very direct bearing upon the probable life expectancy. Many equipment manufacturers have tested their pieces in terms of hours of use and types of loads. Records based on an institution's operation of equipment in terms of normal use or hours of service, however, are not generally available.

Prompt repairs and scrupulous care in cleaning and oiling help materially to prolong the service life. Many instances arise during a day in the kitchen that illustrate this. A mixer whip with one loose strand of wire will shortly wear the tinned surface of the bowl. A motor knock caused by lack of oil or bad alignment will soon result in burned-out bearings or badly worn parts. A leaking valve on a faucet may result in a rusted iron sink which will require repair or replacement at a cost greater than that of a valve gasket. Care in operation, therefore, helps to prevent unnecessary wear or damage. Everyone is familiar with the worker who slaps and slams about his work like the proverbial bull in a china shop. The percentage of breakage is large with such workers and the equipment as a result is likely to be in a battered state, requiring frequent repair. It is not only a pleasure to have employees who are deft, quick, able individuals who treat their equipment with respect, but it is of "dollars and cents" value in terms of equipment costs.

America's war program affects every institution using metal equipment, and operating expense will be greatly increased because of increased cost of materials and labor. The speed with which replacements may be obtained will doubtless continue to be affected by priorities, strikes, and the general flow of business. Dietitians responsible for institution kitchens may do much to foresee and provide for their needs by watching records, comparing with others in their profession, and forecasting requirements.

The Prevalence of Malnutrition

"Nutritional failure" exists as soon as adequate amounts of an essential nutritional factor or factors fail to reach the "milieu interne."

"Dietary inadequacy" means the failure to ingest an essential nutritional factor or factors in amounts sufficient to meet the existing requirement of the body.

"Nutritional inadequacy" means not only the failure to ingest, *i.e.* dietary inadequacy, but failure to absorb, to retain and to utilize an essential nutritional factor or factors in amounts sufficient to meet the existing requirements of the body.

"Malnutrition" is a bodily condition, detectable by any method of examination, caused by a nutritional inadequacy. . . .

The evidence on the prevalence of malnutrition is of three kinds: (1) food consumption records or dietary surveys, (2) official death rates and hospital admission figures and (3) medical assessments of the nutritional status in samples of the population. These three methods should not be expected to yield identical information. Even when each is as fully developed and as accurately interpreted as possible, the result can only show trends reasonably parallel. . . .

It would be interesting to know how much malnutrition is concealed in the 370,600 deaths recorded in 1938 under the heading "diseases of the circulatory system" or in the 75,431 deaths entered under its subclassification "diseases of the heart, unspecified," or among the 2,569 deaths listed as due to "alcoholism" or to know how much is masked by the nomenclature of "senility," "cirrhosis of the liver" and "psychoses." . . .

It is obvious that in the present state of our knowledge concerning the diagnosis of malnutrition due to many of the specific nutritional factors a wide borderline zone exists between nutritional inadequacy and diagnosable malnutrition. This borderline zone is often designated as "subclinical." As soon as a technic becomes available for the diagnosis of a manifestation it is no longer subclinical. The term "subclinical" has also been used to designate recognizable anatomic malnutrition that is subgross, such as capillary invasion of the cornea and some conditions that do not seem to be critical, such as cheilosis and mild rickets. This use is obviously incorrect, for these lesions are clinical and need only to be looked for to be found. In addition, the term has been used both as a cloak for ignorance and as a keynote for derision. For these reasons it should be dropped.—*N. Jolliffe, J. S. McLester, and H. C. Sherman, J. A. M. A. 118: 14, 1942.*

Editorial

DIETITIANS FOR FOREIGN SERVICE, MEDICAL DEPARTMENT, U. S. ARMY

The Publicity Division of the War Department has authorized the Surgeon General of the U. S. Army to release to this JOURNAL the following general information relative to Dietitians for foreign duty with the Army.

The appointment of Dietitians to Theater Hospital Units outside the continental limits of the United States is limited to women, citizens of the United States, and is made by the Office of the Surgeon General from the following groups:

(a) Dietitians already employed in Army Hospitals;
(b) Qualified Dietitians in other Government agencies;
(c) Qualified Dietitians who are enrolled with the American Red Cross;
(d) Qualified individuals who have been associated with the personnel of the unit or with the organization sponsoring the unit and have been requested by the Director of the Unit.

The salaries of assigned Dietitians are as follows:

(a) Head Dietitians—$2,000 per annum, less deductions for subsistence and quarters, when furnished;
(b) Dietitians—$1,800 per annum, less deductions for subsistence and quarters, when furnished.

When assigned to stations within the continental limits of the United States and adequate facilities are available at the Post, Dietitians may be furnished meals at the hospital mess and government owned quarters.[1] If meals and quarters are furnished, deductions will be made from the employee's salary in the amount of $270 per annum to cover the cost of subsistence; $180 per annum from the pay of Head Dietitian, and $120 per annum from the pay of Dietitian, for quarters. When the unit is on duty overseas, quarters and subsistence will be furnished the employee. Deductions for quarters will then be made at a rate of twelve dollars ($12) per annum from the employee's pay, and reimbursement in cash will be made to the hospital fund for any meals furnished at the subsistence rate prescribed for members of the Army Nurse Corps.

This duty is entirely on a voluntary basis. At the present time Dietitians are not entitled to the provisions of war risk insurance. They may, however, make allotments of their salary prior to leaving the continental limits.

Each individual is issued a Certificate of Indemnity which entitles the owner to certain privileges and immunities as set forth by the International Red Cross. In addition, identification tags, in duplicate, will be issued in accordance with Army Regulations.

Individuals are required to pass a rigid physical examination. In addition, immunization will be completed as is prescribed for all military personnel.

Dietitians who are not already employed in the Medical Department of the Army are required to pay their own transportation from their homes to the first station of duty. Each individual should have with her sufficient funds to cover personal expenses for the period of time involved in travel, mobilization, and for a few weeks following arrival at her Post of Duty.

Each individual will be required to have the following articles in her possession at the time of entrance on duty:

One (1) locker trunk, approximately 30½ inches long by 16½ inches wide, and 15 inches deep
One (1) medium-sized suitcase
One (1) warm robe
Underclothing
Toilet articles
One (1) pair of bandage scissors

[1] *Editor's Note:* As stated in the May JOURNAL, approximately 325 dietitians are now on duty in Army hospitals, and probably 400 more will be required. Dietitians who wish to serve with the Medical Department of the Army in hospitals located within the continental limits of the United States should apply either to the U. S. Civil Service Commission or the American Red Cross. All appointments are made through the Corps Areas. As soon as the applicant has communicated with one of the above agencies, it is well for her to write to the Corps Area Headquarters of the section in which she would like to be located. For service outside the continental limits of the United States, the Dietitian again must clear through the Civil Service or Red Cross. The American Red Cross sends the names of all qualified people to the Surgeon General. When the Commanding Officer of a unit is not able to obtain a qualified Dietitian he then calls on the Office of Civilian Personnel to help him secure his quota. All those qualified who wish to enlist for duty should therefore see that their applications are on file with one or the other of the aforementioned agencies.

protective services for children in cities or other areas in danger from bombing or sabotage, or to evacuate children and mothers and the infirm, we would find ourselves confronted with a task for which we are still ill-prepared. The deficiencies in child health and welfare service in the smaller cities and towns back from the seacoast and away from the great metropolitan centers would suddenly become highlighted because these are the communities to which many children would have to be sent. One bombing incident would probably galvanize us into the action for the protection of children that nearly two years of 'defense' has failed in large part to provide. But should such an incident occur today, we would find ourselves short of professional personnel to meet the situation and without an adequate program for interstate action." In Dr. Eliot's opinion, among the many needs which the urgency of the present situation demands are a nation-wide school lunch program and a nation-wide program of training for child care volunteers to assist professional health and welfare workers.

Starting with the statement of the now all too obvious fact that the weakness in the national nutrition drive is that it did not begin sooner, Dr. Boudreau reminds us that Germany, in her war preparations, made full use of modern knowledge of nutrition and that if we are to be successful we must continue with the three-point program of education, supplementing inadequate diets, and enrichment of staple foods. "In some respects the nutrition campaign is still handicapped by tradition. We recognize the need of good nutrition for the armed forces, but we do not yet appreciate that good nutrition is equally necessary for defense workers. The fit, well-nourished civilian in the prime of life goes into military service, while defense industries must be content in many instances with those who cannot pass the selective service examination. The soldier's rations are as nearly ideal as possible; but little attention is paid to the defense worker's food." The following remarks by Mr. Tom Johnson in the British House of Commons are quoted by Dr. Boudreau as worthy of our attention: "I believe that the science of nutrition will do for public health what sanitation did for it in the last half century.... It is rather ironical that it has taken not one war, but two wars, to make the people of Scotland wake up to the public scandal of underfeeding."

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HELEN T. PARSONS, PH.D.[2]

Among the various cuts of meat, animal organs are perennially in need of promotion. Such foods as liver and heart are valuable, not only in respect to their total iron content, but even more so on the basis of the available iron. According to published data from Sherman, Elvehjem, and Hart,[3] the available iron in beef liver and heart amounts to 70 per cent of total iron content, as compared with 50 per cent in beef muscle and 20 per cent in spinach.

The unique place of liver as a source of most of the B group of vitamins is shown in table 1, the figures for which were taken from *The Vitamin Content of Meat* by H. A. Waisman and C. A. Elvehjem. Data from "Recommended Daily Allowances of Specific Nutrients," Committee on Food and Nutrition, National Research Council, 1941, have been used in determining percentages of daily needs, using those for a moderately active woman or sedentary man. In introducing liver into the diet of children or even of adults, the unfamiliar flavor may be liked better if it is diluted. Cubes of liver delicately sautéd only to the point of the disappearance of the pink color, and served with potato, rice, corn meal mush or dumplings may disarm antagonism, as may also liver sausage or a spread in which other ingredients and flavors are blended; or simulated Swiss steak from sliced liver with flour pounded in. Blandness first, then wide variety in preparation to avoid monotony, is a good rule. A bulletin on liver, published by the University of Wisconsin, gives directions for the cookery of hog liver, a particularly inexpensive food.

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Much of the "practical advice" has to do with nutrition and, although not new, the information and suggestions in the articles do give recognition to the need for work in this field. Dr. Winslow cites the Stiebeling studies of the health of industrial workers' families which showed that only 26 per cent had good diets, and the report by Dr. Robert S. Goodhart that most of the men in a large West Coast plant arrived without breakfast. He states that the actual provision of a low-cost meal on each shift would accomplish more than "volumes of letter press." This has been done in England and, in the opinion of Dr. Winslow, such projects, if carried out in this country, would make a tangible and immediate contribution to the winning of the war.

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Dr. Victor Heiser classes the badly nourished and the fatigued among the "unnecessary casualties in the battle of the assembly lines." The point at which fatigue attacks the worker depends on a host of variables—robustness of constitution, type of work, mental attitude, posture, and diet. The problem of real production speed becomes one of raising the fatigue point for the weak and eliminating these contributory factors—physical difficulties, worry, bad posture, and malnourishment (not necessarily undernourishment). Dr. Heiser comments on the results which have been reported from experiments in providing natural foods for men in industrial plants, such as the between-meal snacks served in England. He also cites the demonstration in Springfield, Massachusetts, sponsored by a local newspaper as part of its "food for defense" campaign, when hot luncheons were served to the factory workers and office staff of a small defense plant by Red Cross canteen and motor corps volunteers. The latter project has set the pace for other similar activities by the Red Cross, including the serving of food at four o'clock in the morning to workers engaged in turning out guns. In recognition of the close relationship of food to the product of the assembly line, the National Association of Manufacturers is considering a nation-wide nutrition campaign designed for the women who pack lunch boxes and plan the home meals. It is hoped that educational efforts will be continued until defense workers are made to see that "to remain healthy is their duty to their country," Dr. Heiser concludes.

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a substitute for *all* of the nutrients lost in the refining of white flour. It is only by using the natural 100 per cent whole wheat that we may expect to get all of the nutrients that are possible through products in which flour is a basic element. For years many of us, as home economics teachers, have taught our students that modern methods of milling robbed the wheat of its valuable protective constituents, but in our foods classes we have continued to teach students to use white flour for bread and sweet rolls, cakes, pies, and cookies. However, in our teaching we must first disregard the regularly accepted standard of quality for bread made with white flour and adopt in its place a new criterion based upon the eating quality of a 100 per cent whole wheat loaf.

Next, we must see that the whole wheat is finely ground and *fresh*—free from rancidity. Too often when the housewife makes a whole wheat product she finds that it does not have the expected nutty flavor, all of which has been a handicap to its use. A small hand-mill available for less than three dollars does make it possible, however, to grind small amounts of wheat as needed, thereby assuring freshness. If we develop sufficient interest and demand for good whole wheat bread, some miller will doubtless be encouraged to work on the problem of producing a satisfactory whole wheat flour that will stay fresh for a reasonable length of time.

At the beginning of our work on whole wheat bread at the State University of Iowa we purchased wheat from a feed store, washed, dried, ground it, and made bread using a basic white flour recipe. Our first attempts were miserable failures. We soon learned that we could not make good bread without good wheat. We discovered also that we could determine, to a considerable extent, the flavor of the bread if we tasted the ground raw wheat. Good wheat has a rich nutty flavor that is unmistakable. Poor wheat has a flat or, in some cases, the rank, acrid after-taste of a definitely rancid product.

After our first failures we continued to search for good wheat and after a number of unsuccessful attempts we were able to find clean, hard winter wheat of excellent quality. With an electric mill we started grinding the wheat into flour. Our third problem was to develop a recipe that could be used satisfactorily by homemakers. We tried many different combinations and proportions of ingredients as well as different methods of mixing and finally developed a recipe which was universally well liked. In fact we found that many preferred our 100 per cent whole wheat bread to the white when we had experimented long enough to develop a loaf that could stand on its own merits, judged by the predetermined standard —excellent eating qualities and high nutritive value.

The next problem was to find on the market good whole wheat flour made of hard winter or hard spring wheat, in order to secure sufficient volume in the loaf. Eventually we found a number of kinds of suitable flour. Obviously, it had to be purchased in small quantities and stored in a cool place for short periods of time. Having developed a satisfactory recipe for a 100 per cent whole wheat bread that homemakers might use successfully, we determined to make the flour easily available through local grocers. We then launched a promotional campaign by extending invitations to a group of about sixty housewives and social workers to attend a bread-making demonstration. During a one-hour period the women saw the bread at various stages in its making, from the sponge to the oven. Copies of the recipe were distributed and whole wheat bread sandwiches served. Following this, another group of sixty requested a similar demonstration, for many homemakers realize they need help in learning the best method of manipulation for whole wheat products. If we stop short and merely tell homemakers to *use* whole wheat, it will be difficult to increase the present very small percentage of whole wheat users.

The whole wheat bread also found favor with the home economics students who decided to feature such bread in a food sale which they had been asked to sponsor. The students who made the 240 loaves for the food sale found they were unable to fill the many subsequent requests for the bread. With each loaf a recipe sheet with full directions was enclosed. After this, the sale of the whole wheat flour markedly increased and many people in the city were making the bread. Soon a local baker began to make the bread, using the recipe we had developed. Reports indicate that his sales are continuing and that the bread is now sold at a cooperative store.

Although whole wheat may be used most effectively in yeast bread, it should be used more frequently in other batter and dough products. It is not necessary to develop an entirely new series of recipes for all of these. Good cakes, cookies and, of course, muffins, griddle cakes, and quick breads may be made with the whole wheat flour. When these are prepared for people with definite prejudices, better results may be obtained if some enriched white flour is used with the whole wheat at first, gradually increasing the proportion of whole wheat in succeeding recipes. For example, we found that those who had expressed dislike for whole wheat soon preferred the bread made with 80 and 100 per cent whole wheat to the 50 per cent. A recipe for the bread follows:

WHOLE WHEAT BREAD

3 teaspoons salt
¼ to ⅓ cup molasses and honey (1½ tbsp. dark molasses and 2½ tbsp. honey, *or* 2½ tbsp. dark molasses and 3 tbsp. honey)
¼ to ⅓ cup butter
1 pint scalded milk
1 yeast cake
5½ cup (approximately) finely ground hard spring or hard winter wheat flour

Measure salt, honey, molasses, and butter and place in bowl. Add milk and cool mixture to 80°F. (slightly cooler than lukewarm). Mix yeast with a little of this cooled mixture. Add to the rest of the mixture. Mix approximately half of the flour into the above mixture and stir until smooth. Continue adding flour until stiff enough to knead. Some wheats will absorb more liquid than others. If a hard winter or hard spring wheat is used it is seldom necessary to use more than 5½ cup flour per pint of milk. Knead until the mixture has become smooth and does not stick to the board, usually about 5 to 7 minutes, or 250 to 300 kneading strokes.

Place kneaded dough in a lightly buttered bowl. Cover with a towel. Let rise at a temperature of 80° to 85°F. If a constant temperature is difficult to maintain, the bowl of dough may be placed in lukewarm water (95° to 98°F.). Allow to double in bulk (2 to 2½ hours if the dough is kept at 80°F.). Knead 100 strokes or approximately 2 minutes. Let rise again until double in bulk (approximately half the time required for the first rising if conditions are the same). Knead 100 strokes. Divide into two portions, shape each into a loaf and place in 8″ x 4″ loaf pans, smooth side up.

Let rise until double in bulk (approximately 30 to 35 minutes if temperature of dough is 80°F.). Too long rising in pan is undesirable as it results in a crumbly loaf.

Start baking at 425° to 450°F. After 15 minutes (or when browned) reduce to 350°F. The total baking period should be 45 to 50 minutes.

While I am confident that the twenty-five or thirty thousand professional home economists in the United States could more effectively encourage use of whole wheat in the future, it is exceedingly important that we also enlist the interest and active support of all the homemakers trained in home economics who certainly could be counted upon to assist in a program designed to improve the nutritional status of people at all economic levels.

Even though we now have enriched white flour, we should continue to encourage the use of whole wheat flour, and when we speak of white flour, let us say, *enriched flour*. The recommended dietary allowances can only be effective through wiser utilization of available food products, of which bread is a basic item.

THE DIETITIAN'S CONTRIBUTION TO CIVILIAN HEALTH[1]

MARGARET JOSEPH

The practical application of the science of nutrition, dietetics, and that of the science of aeronautics, aviation, have been growing up together. We do not, of course, know all the answers in either field, but we do know as much, relatively, about what nourishes a human body as is known about what gets a heavy machine up in the air and to its destination safely. And we know, too, that far less of our nutritional knowledge than our aeronautical knowledge is applied.

In a country of one hundred and thirty million people it will take a host of workers to carry the knowledge of nutrition to every person. Dietitians and nutritionists are few in proportion to the population of the country. To conserve the services of this small group of trained people so that they may do the tasks for which they are qualified through training and experience, there must be a more willing group of volunteer workers ready to assist us.

In recruiting lay helpers we can create a corps of well-informed people by organizing training courses for leaders, who will in turn spread this knowledge of nutrition and thus aid in the program of conserving and improving civilian health. Enthusiasm and interest in the program can be created by giving food demonstrations and exhibits, and conducting field trips to industrial cafeterias and local public eating places. Home gardening and other means of food production, too, can be encouraged.

We must be resourceful and really know how to use our food as a basic weapon. For centuries it has been said to determine the strength of armies, and now we realize more than ever its influence upon the productive ability of the civilian population. The civilized world has come to believe that regardless of race, color, creed, or job, all should have equal opportunity for health. Whatever our democratic ideal may be, its achievement is dependent upon the vigor of the population. Provision of the proper kind and the right amount of food is one of the government's primary responsibilities.

Experts in nutrition should and will supply guidance in the scientific use of natural foods in order to protect and build civilian health, which in turn will decrease illness and lessen the burden of our physicians and nurses. In my community of 30,000 I have found the women very enthusiastic and eager to increase their knowledge of nutrition. Many more than we were prepared to teach enrolled in the Red Cross nutrition course, which is a prerequisite to the canteen course. These women seemed to realize the importance of the canteen service not only in time of war, but in other disasters, as in floods, fires, and wind-storms. Now our problem is to obtain more nutrition instructors.

The words of Surgeon General Thomas Parran need only be repeated to warn us of our duties: "All of us today are conscious of the grave task lying before us. We shall need in the days to come rugged health and courage such as the world has never seen. The magnitude of our effort for this is only the beginning of our historic task. After the war . . . all the strength and courage that America can muster will be needed for the rebuilding of a shattered world. We Americans must be conscious of our destiny—for America is the last great hope on earth." It is up to us as dietitians to put this health program

[1] Excerpts from a talk by Miss Joseph, St. Joseph's Hospital, Parkersburg, West Virginia, before the joint meeting of the Virginia and West Virginia Dietetic Associations and the Virginias-Carolinas Hospital Associations, Richmond, April 17, 1942.

across by offering our services. If any one dietitian has not volunteered, or is not contributing her share, she should do so immediately.

NUTRITION IN THE DEFENSE PROGRAM IN VIRGINIA

Reporting for the Richmond section on the volunteer work of local dietitians and home economists in the defense program, Margaret Fitzhugh, director of cafeterias, Richmond Public Schools, gave an interesting account of the educational program and the preparation and training of workers for emergency feeding at the Virginia Dietetic Association meeting, April 17. In this section the Volunteer Service Bureau, the Richmond Nutrition Committee, and the Red Cross have coordinated their activities in order that the time and energy of professional people may be used to the best advantage.

The Federal Security Agency has selected Richmond for a nutrition demonstration, and Eleanor Enright and Mrs. Helen Montfort Moodie are assisting in the organization of the work. Mrs. Jane S. Williams, nutritionist, Federal Security Agency, will work with the negro groups.

The nutrition program in Richmond has been based on three main principles: *Stimulation of interest*, through newspaper publicity, radio talks or interviews, and distribution by chairmen of various precincts of notices about meetings, demonstrations and general activities of the program. Once a month a large meeting is held with a speaker of national importance in the field of nutrition, followed two weeks later by unit meetings conducted by state and local nutritionists. Twenty women's organizations have appointed committees of three to attend the meetings and report work that is being done. *Teaching* is carried on through nutrition classes, home study courses, talks to clubs, newspaper publicity, and moving pictures made available by the Richmond Public Library, the Dairy Council, and the Health Department, and books made accessible by the Public Library and the Library of the Medical College of Virginia. A committee of dietitians prepared low-cost budgets for the use of the social service department of the city, using prices obtained in the local market, and another committee prepared a home study nutrition course for women unable to attend regular classes. As an outgrowth of these efforts, the public schools have launched a program to improve the standard of the lunches bought or brought by the children.

A most interesting device is being used to test the third principle of the program, *application*. Through the cooperation of the Office of Civilian Defense and the wholesale and retail merchants, members of the Housewives League have conducted a survey in the stores to determine whether there have been changes in the buying habits of Richmond homemakers.

In the Tidewater Area, which includes Norfolk, Erna Mae Behrend, Norfolk General Hospital, gave an account of the canteen courses in Norfolk, started after the hurricane in 1938, under the direction of Melva Bakkie, and continued to the present time when thirty hours of service a year are required to retain the status of canteen worker in the Red Cross. There are now 1100 trained canteen workers in Norfolk, and four months during the winter sandwiches were served to the men guarding bridges in the area. Last year 1200 meals were served at the Red Cross chapter house. Meals are now being served at the chapter house and at public schools in nearby communities, also to blood donors in hospitals. Canteen centers are being organized at the Casualty Stations throughout the city, with a dietitian assigned to each, and dietitians are also teaching canteen courses in various sections of the city. The Tidewater group is planning to supply the service equipment for a mobile kitchen which is to be purchased with private donations.

In connection with their publicity efforts, the Tidewater Dietetic Association is planning a series of articles on nutrition and its present particular application to war conditions, which will appear in the local newspapers under such heads as: "The School and Family Lunch Box"; "Sugar Substitutes"; "Foods for Victory"; "Vitamins and Minerals," etc.

In the Southwest Virginia area, with headquarters at Roanoke, nutritionists and dietitians are working together, according to Ella Sue Carr. Dietitians are giving lectures on nutrition in home nursing classes and otherwise cooperating with the Roanoke City Nutrition Committee, of which Mrs. Evelyn Hyde, a member of the dietetic association, is chairman for the city. Activities include: nutrition talks to P.T.A. groups, reaching a total of 1021 women; addresses to school children; nutrition courses; refresher courses for graduate home economists and dietitians to prepare them for teaching; movies; radio and newspaper publicity; posters in busses and store windows; and educational displays at the Roanoke Public Library and in stores. The week of March 16–21 was designated as "Food Defense Week" for the purpose of making "all working people and homemakers vitally conscious of nutrition." Dietitians and home economists are presenting a nutrition course over the local radio station every Monday and Wednesday morning which began April 6 and will continue to the last week in June, and condensed nutrition courses will be given in school auditoriums for women who do not want certificates.

The Approximate Vitamin Requirements of Human Beings[1]

THE FOLLOWING probably represent perfectly "safe" levels for daily intake of B-vitamins by human beings, even under conditions of pregnancy and lactation: thiamin 3.2 mg., nicotinic acid 40 mg., riboflavin 3.7 mg., pantothenic acid 11 mg., biotin 0.14 mg., inositol 1000 mg., pyridoxine 1.5 mg. and folic acid 1.0 mg. unit. It is not certain, of course, that all the B-vitamins in the last four substances are actually required by human beings. Regardless of this fact, the vitamins actually occur in foods to about the extent indicated.

The National Research Council Committee on Foods and Nutrition has recently given careful study to the vitamin requirements of human beings. On the basis of available information, the thiamin requirement on a 2500 calorie basis has been estimated at 1.5 mg. daily. During pregnancy and lactation this is raised (figured on the same calorie basis) to 1.8 mg. and 1.9 mg., respectively.

No one, so far as I know, has ventured an estimate of the human requirement of pantothenic acid, but it appears safe now to conclude that it cannot be far from 10 mg. a day. The validity of this estimate is suggested by the fact that cow's milk yields 10.5 mg. per 2500 calories, and human milk 10.9 mg. per 2500 calories. The pyridoxine requirement, following the same line of reasoning, appears to be about 1.5 mg. a day, that of "folic acid" (assuming it to be required) about 1 mg. unit a day, and that of biotin about 0.15 mg. a day. Inositol is obtained predominantly from vegetable sources, and the amount associated with 2500 calories of food varies tremendously, depending on the source. A good mixed diet yields 1 gm. a day or more.

Assays of various types of organisms (mammals, insects, bacteria, yeasts, higher plants) indicate that all eight of the B-vitamins considered are always present. There appears, particularly in the case of thiamin, nicotinic acid, riboflavin and pantothenic acid, a definite tendency toward parallelism in the content of whole organisms. Yeasts, for example, are five to ten times as rich as the mixed diet in each of these four vitamins. Insects (cockroaches and termites), on the other hand, are in every case two to four times as rich in these vitamins as the mixed diet. The other B-vitamins tend to be more evenly distributed in the lower and higher forms of life. It thus appears that the tentative human requirements mentioned are parallel to but much lower than the amounts (figured on an isocaloric basis) which insect-eating birds or yeast-eating insects obtain.

It is obvious that for various reasons (economic inability, use of decorticated grains, losses in cooking and cooking water, use of refined sugar and "refined" foods) most people do not get as much of the various B-vitamins as they probably should have.

Unfortunately, while yeast and liver are rich sources of B-vitamins, both known and unknown, they do not necessarily yield extracts which are extraordinarily rich. The B-vitamins occur in bound form and are freed only by some type of digestion (autolysis or otherwise). When digestion is used to free the vitamins, much other soluble material is formed which contaminates the extract. One commercial brewers' yeast extract (from autolyzed yeast) was assayed for the eight B-vitamins considered and found to be a good source of each. A calculation showed, however, that in order to get enough of the B-vitamins to equal the intake on a good diet, one would have to consume 10 per cent of one's calories in the form of this yeast extract (7 to 8 teaspoons of dry powder). In a preparation such as this the physician could hardly expect to find a therapeutic agent of pronounced value. Extracts or preparations which are worthy of consideration should be plainly labeled as to their content of the various B-vitamins and enough should be present to allow significant dosage. For correction of a deficiency it may be desirable in some cases to give several times the ordinary daily intake.

A survey of a number of representative vitamin B complex preparations with regard to their content of B-vitamins showed that in the average daily adult dose, thiamin content ranged from .75 to 3 mg., riboflavin .25 to 2 mg., nicotinic acid .15 to 35 mg., pantothenic acid .225 to 1 mg., and pyridoxine from .035 to 1 mg., whereas amounts contained in a well rounded diet (2500 calories) showed values of 3.0, 3.7, 40, 11, and 1.5 mg. respectively for these vitamins. It is apparent that these preparations are in general wholly inadequate as sources of the vitamin B complex. Several of them may be of value because of their fortification with thiamin, nicotinic acid or riboflavin, but they fail to contain anything like "balanced" amounts of the various B-vitamins.

[1] Excerpts from a report by Roger J. Williams, Ph.D., D.Sc., Professor of Chemistry and Director, Biochemical Institute, University of Texas, in the *Journal* of the American Medical Association, May 2, 1942.

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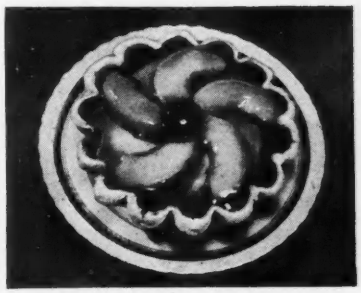
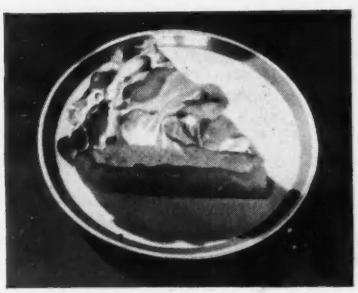
CHERRY FLAKES with Orange Sections—about 2¢ a portion

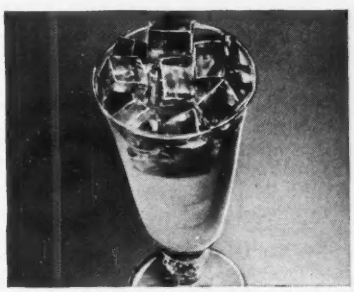


PEACH TART GLACÉ—about 5¢ a portion

BUTTERSCOTCH PUDDING—about 3¢ a portion (*without cream 2½¢*)



LEMON PIE—About 3½¢ a portion (*cut 8 pieces*)



STRAWBERRY WHIP AND CUBES—about 1¢ a portion

Jell-O & Jell-O Puddings

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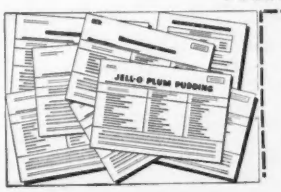

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A Manual of Endocrine Therapy. By Bernard L. Cinberg, B.A., M.D., New York: Chemical Publishing Co., Inc., 1942. Cloth. Pp. 178. Price $3.25.

This is a compact, useful book for the clinician who is interested in endocrine therapy. It is the practical answer to one of the important medical questions of the hour: "What clinical results can be obtained by the use of newer endocrine preparations?" The author briefly discusses the tangible results which may be obtained by the use of the newest endocrine preparations. Theoretical discussions of the endocrine syndromes have been kept to the minimum, and a maximum of space has been allotted to a review of therapy. The clinician is given, in a comprehensive, unbiased manner, the exact details of all the tested endocrine regimens which may be utilized in any given situation. The therapy of amenorrhea, meno-metrorrhagia, sterility, dysmenorrhea, pruritis vulvae, obesity, the menopause, growth abnormalities, impotence, undescended testicles, and a host of other common clinical problems, is specifically described.

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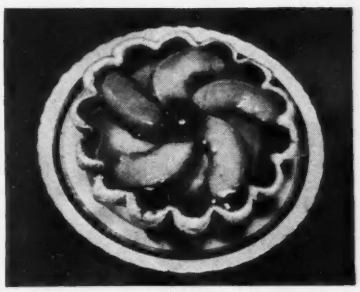

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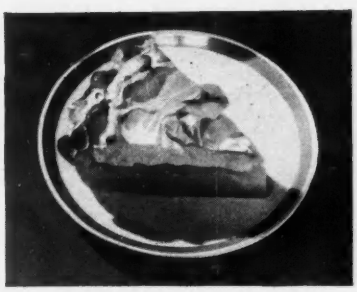

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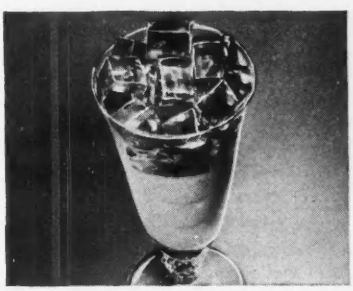

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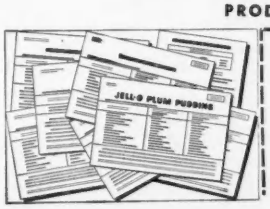

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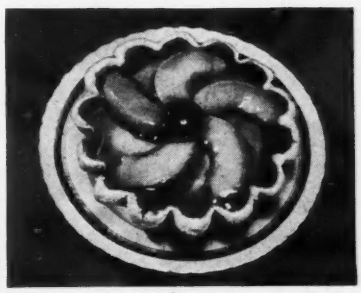

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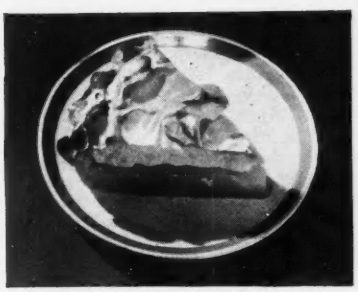

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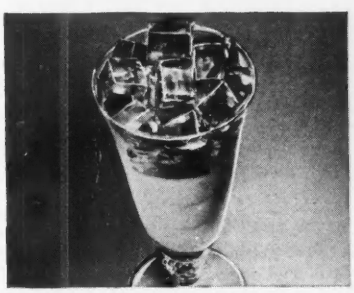

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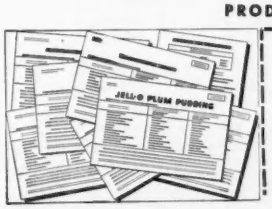

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Book Reviews

Food Values in Shares and Weights. By Clara Mae Taylor, Ph.D., Assistant Professor of Nutrition, Teachers College, Columbia University. New York: The Macmillan Company, 1942. Washable Linen. Pp. 92. Price $1.50.

Dietitians and nutritionists will welcome this book with enthusiasm. The late Mrs. Mary Swartz Rose had planned its publication and after her death in 1941 it was decided that Dr. Taylor, who was to have co-authored the book with Mrs. Rose, should carry on as sole author. According to the foreword by Dr. Grace MacLeod, "As plans progressed, and the new dietary allowances necessitated recalculation throughout, on account of the resulting new share values, it was decided to include a table of weights in addition to the table of shares. Also, in order to simplify calculations and the making of comparisons between foods, it was decided that values for like products should be given for the same measure, for example, values for all fruit juices are given for one cup."

The system of expressing food values in shares was first described by Mrs. Rose in the original edition of *The Foundations of Nutrition*. The book under review is particularly timely, as it offers a quick method of evaluating a dietary. Approximately 500 common foods and prepared dishes are included in the tables which are based upon the booklet, *Food Value of Recipes in Shares and Vitamin Units*, by Mrs. Rose and Dr. Taylor, but the protein, mineral, and vitamin values have been completely recalculated according to more recent information on food composition.

The contents are divided into two parts. Part I, Food Values in Shares, explains the share system and includes a table which shows the "recommended daily allowances for specific nutrients" in terms of shares. Other interesting features are: form for recording food intake for one day; and form for calculation of food intake for one day in shares. Part II, Food Values in Weights, follows more or less the plan of the first section except that food values here are stated in weights. New recipes along with new values for a number of foods have also been included.

Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine. By Williams McKim Marriott, B.S., M.D., Late Professor of Pediatrics, Washington University School of Medicine. Revised by P. C. Jeans, A.B., M.D., Professor of Pediatrics, State University of Iowa. Third edition. St. Louis: The C. V. Mosby Company, 1941. Cloth. Illustrated. Pp. 475. Price $5.50.

The revision of this excellent book by the late Dr. Marriott was placed in very capable hands. The current edition, therefore, brings the content quite in line with present-day knowledge of nutrition. Other than this, the book fortunately has been changed but little from previous editions, for as Dr. Jeans says in the preface to this latest edition: "It was Dr. Marriott who established the entire subject of infant nutrition on a simpler, more logical and more common-sense basis."

Laboratory Manual in Anatomy and Physiology. By Caroline E. Stackpole, A.M., Associate in Biology, and Lutie C. Leavell, R.N., A.M., Instructor in Biology, Teachers College, Columbia University. New York: The Macmillan Company, 1941. Pp. 214. Price $1.50.

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QUESTION: *What one thing does every patient need?*

ANSWER: *Well-balanced food with powerful appetite appeal.*

QUESTION: *But many patients seem to have no appetites in hot weather.*

ANSWER: *"Seem" is right. Just serve them a crisp, cool breakfast of*

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Hits the spot for lunch, supper, bedtime, too. Also ask for it in hotels, restaurants, dining cars.

Current Literature

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 9, March 1942

* Prognosis of regional enteritis. P. W. Brown and C. J. Donald.—p. 87.
* Ulcerative colitis—an allergic phenomenon. A. F. R. Andresen.—p. 91.

Regional Enteritis. Chronic regional enteritis may originate at any point in the small intestine. It is characterized by remissions and exacerbations similar to those encountered among patients who have peptic ulcer and chronic ulcerative colitis. The disease tends to progress, either orad or caudad, with increasing failure of absorption, even to the point of actual starvation of the patient because of failure to absorb food. The treatment of choice is surgical removal of the diseased segment of bowel. The most important feature in postoperative care is maintenance of a high protein diet supplemented with the vitamin B group.

Ulcerative Colitis. Ulcerative colitis is due to food allergy in at least 66% of cases. There is a resemblance between the mucosal lesions of ulcerative colitis and allergic reactions in the skin. Pathological findings in early ulcerative colitis are identical with those in allergy experiments in humans and animals. Proctoscopic and roentgenological examinations can be used to demonstrate the effect of allergenic foods and the improvement on their withdrawal from the diet. Treatment based on allergic considerations has produced results which are better than those based entirely on an infective etiology.

AMERICAN JOURNAL OF DISEASES OF CHILDREN

Vol. 63, March 1942

* Nutritional edema in children. J. Chen.—p. 552.

Nutritional Edema. The literature on the nature and development of nutritional edema is reviewed and 130 children with nutritional edema and 292 with nutritional deficiency without edema studied. The edema did not alter the clinical manifestations of the other nutritional deficiency conditions or complicating diseases. Nutritional edema was present more frequently in older children than in infants. Total serum protein was lowered in both edematous and non-edematous patients. The presence of edema did not alter the general mortality.

AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 203, March 1942

* Study of the B vitamins in the human subject. IV. Mental changes in experimental deficiency. H. E. O'Shea and K. O'Shea.—p. 388.

Contributed by Colleen Cox Hambleton, Food Utilization Division, Bureau of Home Economics, U. S. Department of Agriculture, Beltsville, Maryland, and Quindara Oliver Dodge, School of Home Economics, Simmons College, and Women's Educational and Industrial Union, 264 Boylston Street, Boston.

* Immediate feeding versus initial starvation in the treatment of bleeding peptic ulcer. J. P. Eichhorn.—p. 428.

B-Vitamins. Foresight and judgment, as measured by performance on maze tests, are impaired when the subjects are deficient in the B-vitamins and are improved after therapy with thiamin or the B complex. General intelligence, reasoning ability and speed of hard muscle coordination show no measurable deterioration when the subjects are deficient in the B-vitamins.

Peptic Ulcer. In a series of 81 patients with bleeding peptic ulcer, 43 were deprived of food and 38 fed immediately. Immediate liberal feeding resulted in a greatly lowered mortality rate, more comfort for the patient and a shorter hospital stay.

ARCHIVES OF PEDIATRICS

Vol. 59, March 1942

The premature infant. Part III. M. Gleich.—p. 157.
* Derangements of deciduous dentition. J. Schwartzman.—p. 188.

Deciduous Dentition. The basic cause for dental disturbances is probably not a dietetic nor a vitamin deficiency but apparently is connected with the structural development of the tooth and jaw, proper adjustment of the body's defensive organs, and the child's increased sensitivity to trauma plus the reflex reaction from the site to other parts of the body.

JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 143, March 1942

* The synthesis of 11-S-(β-amino-β-carboxyethyl) homocysteine and the replacement by it of cystine in the diet. V. Du Vigneaud, G. B. Brown and J. P. Chandler.—p. 59.
* The relation of aspartic acid and glucosamine to growth. W. C. Rose and S. S. Fierke.—p. 115.
* Fatty livers and glucose tolerance in the white rat. C. R. Treadwell, W. C. King, K. C. Bebb and H. C. Tidwell.—p. 203.
* Histochemical changes associated with aging. II. Skeletal and cardiac muscle in the rat. O. H. Lowry, A. B. Hastings, T. Z. Hull and A. N. Brown.—p. 271.
* Histochemical changes associated with aging. III. The effects of retardation of growth on skeletal muscle. O. H. Lowry, C. M. McKay, A. B. Hastings and A. N. Brown.—p. 281.

Thio Ether of Homocysteine. The synthesis of 11-S-(β-amino-β-carboxyethyl) homocysteine is described. This thio ether can serve in lieu of cystine in the diet for the support of growth of animals. The possible significance of this finding to the question of the mechanism of the conversion of methionine and homocystine to cysteine is discussed.

Aspartic Acid and Glucosamine. By the use of diets devoid of proteins, but containing mixtures of highly purified amino-acids, aspartic acid and glucosamine have been shown to be dispensable components of the food. Rats

Portrait of a young man improving his diet

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deprived of either of these compounds increase in body weight just as rapidly as do litter mate controls receiving a like ration supplemented with the compound in question.

Glucose Tolerance. No direct relationship was found between glucose tolerance and the fat or glycogen content of the liver of rats. The most marked decrease in tolerance was observed in animals receiving a diet which was high in fat and low in lipotropic factors (40% fat and 5% casein). Glycogen appeared to be deposited independently of the liver lipids.

Aging. The concentrations of water and chloride in the skeletal muscle of the rat decrease during growth and rise again in old age. The concentrations of potassium and phosphorus likewise decrease during growth but continue to fall in senescence. The intracellular concentration of phosphorus and potassium decreased during growth in skeletal muscle; but during senescence, the concentration of water, total phosphorus, and potassium in the muscle fibers underwent no significant change.

Retardation of Growth. In 611 and 752-day-old rats whose growth had been retarded through the limitation of caloric intake, the skeletal muscles contained more chloride, water, total phosphorus, and potassium than those of well-fed 610-day-old controls.

JOURNAL OF NUTRITION

Vol. 23, March 1942

* A convulsive syndrome in young rats associated with pyridoxine deficiency. E. P. Daniel, O. L. Kline and C. D. Tolle.—p. 205.
* The iron metabolism and requirement of young women. R. M. Leverton and A. G. Marsh.—p. 229.
* The effect of enzymatic digestion on the pantothenic acid content of meats determined by the microbiological method. H. A. Waisman, L. M. Henderson, J. M. McIntire and C. A. Elvehjem.—p. 239.
* Vitamin supplementation of U. S. Army rations in relation to fatigue and the ability to do muscular work. A. Keys and F. Henschel.—p. 259.
* Quantitative distribution of phosphorus and calcium in certain fruits and vegetables. H. C. Sherman and M. S. Ragan.—p. 283.

Effect on growth and calcium assimilation of citric acid—potassium citrate mixtures. C. S. Lanford.—p. 293.

* The state of vitamin A in the liver of the rat. II. The effect of feeding the vitamin over extended periods. E. LeB. Gray and J. D. Cawley.—p. 301.
* The rate of increase of blood plasma ascorbic acid after ingestion of ascorbic acid (vitamin C). E. N. Todhunter, R. C. Robbins and J. A. McIntosh.—p. 309.

Pyridoxine Deficiency. A convulsive syndrome occurred in young rats during the suckling stage while being nursed by mothers on a diet considered to be satisfactory from the standpoint of growth and reproduction. It was cured or prevented by administration of crystalline pyridoxine and, by the use of suitable diets, was demonstrated to be a specific result of pyridoxine deficiency. Rapid depletion of pyridoxine reserves was obtained in suckling young given to deficient mothers and lactating females transferred from a stock diet to one deficient in pyridoxine. No injury was observed in females maintained on pyridoxine-restricted diets through the period of pregnancy and lactation. Lactation was not impaired even though the pyridoxine content of the milk was reduced to such extent that the convulsive syndrome developed in the young.

Iron Metabolism. Ninety-nine 1-week iron metabolism studies were made on 69 young women between the ages of 16 and 27 years living on self-chosen diets. The average daily intake of 10.44 mg. iron provided an average daily storage of 1.37 mg. As the level of intake rose from below 8 mg. to 16 mg. the occurrence of negative balances decreased and the amount of iron stored increased. Calculations to determine whether a diet contains an adequate amount of iron may eventually be discontinued since it appears that emphasis should be placed upon obtaining diets optimal in other essential nutrients which have been shown to function in efficient iron absorption and utilization.

Pantothenic Acid in Meats. Animal tissues contain considerable amounts of pantothenic acid. Liver and kidney were the richest of any of the tissues studied while striated muscle, heart, lung, pancreas, brain and spleen contained appreciable quantities. Pantothenic acid in animal tissues occurs in combined form and is liberated most completely by pancreatin digestion. There is a decrease of approximately 30 to 40% of the vitamin in the cooked or commercially processed samples.

Vitamins and Fatigue. Soldiers maintained on standard U. S. Army garrison rations were repeatedly subjected to standardized severe exercise on the motor-driven treadmill. Circulatory, metabolic and blood chemical responses were measured. There were no indications of any effects, favorable or otherwise, of the vitamin supplementation on muscular ability, endurance, resistance to fatigue, or recovery from exertion. Healthy young men expending an average of 3700 to 4200 calories per day are not benefited by a daily supply of more than 1.7 mg. thiamin chloride, 2.4 mg. riboflavin, and 70 mg. ascorbic acid.

Calcium and Phosphorus in Foods. Quantitative studies have been made of the relative amounts of calcium and phosphorus in fruits and vegetables. In "small fruits" as blackberries, currants, and raspberries, the phosphorus content is significantly different when the "edible portion" of the fruit is analyzed with and without the seeds. The grape seeds show three times as high a percentage of phosphorus as the flesh, but constitute so small a proportion of the whole fruit as scarcely to influence its average composition. In tomatoes, okra, and squash (fruits commercially classified as vegetables) the phosphorus content of the edible portion was measurably influenced by the inclusion or exclusion of the seeds. There is a transfer of phosphorus from pods to ovules in maturing beans. Also well marked is the concentration of calcium in the septa of oranges as compared with the juice. Orange juice, when carrying the softer portions of the pulp, contained only 27% of the calcium of the edible portion of the orange.

Vitamin A in the Liver. When vitamin A is fed in moderate amounts over long periods of time, the amount stored in the liver is gradually transformed from its combination with several fatty acids to a union with but one.

Ascorbic Acid Absorption. Five subjects, studied for rate of increase in plasma ascorbic acid after ingestion of 50 mg. of this vitamin, showed close similarity in response by the different subjects and by the same subject at different times. The ascorbic acid content of blood plasma began to rise within 30 to 60 minutes after ingestion and returned to the fasting level in 3 to 4 hours. The maximum increase in plasma level was reached within 1½ hours after ingestion of 50 mg. ascorbic acid in either the crystalline form, as orange juice, or as orange sections; in 2 hours when strawberries were the source of ascorbic acid; and in 2½ hours when cauliflower was eaten. When the intake was raised to 400 mg. ascorbic acid there was a greater increase in plasma concentration and a longer time elapsed before returning to the original fasting level.

MILBANK MEMORIAL FUND QUARTERLY

Vol. 20, April 1942

*Nutritional failures: their causes and prevention. N. Jolliffe.—p. 103.
*Medical evaluation of nutritional status. Part IX: The reliability of visual threshold during dark adaptation as a measure of vitamin A deficiency in a population group of low income. E. P. Hunt and K. M. Hayden.—p. 139.
*Part X: Susceptibility to dental caries and family income. H. Klein and C. E. Palmer.—p. 169.
*Part XI: An analysis of sources of errors in the photelometric macromethod of determining ascorbic acid in plasma. D. G. Wiehl and M. Kantrovitz.—p. 178.

Nutritional Failures. The reasons for nutritional failure are manifold and include such varied causes as food processing methods, individual food habits, knowledge of food val-

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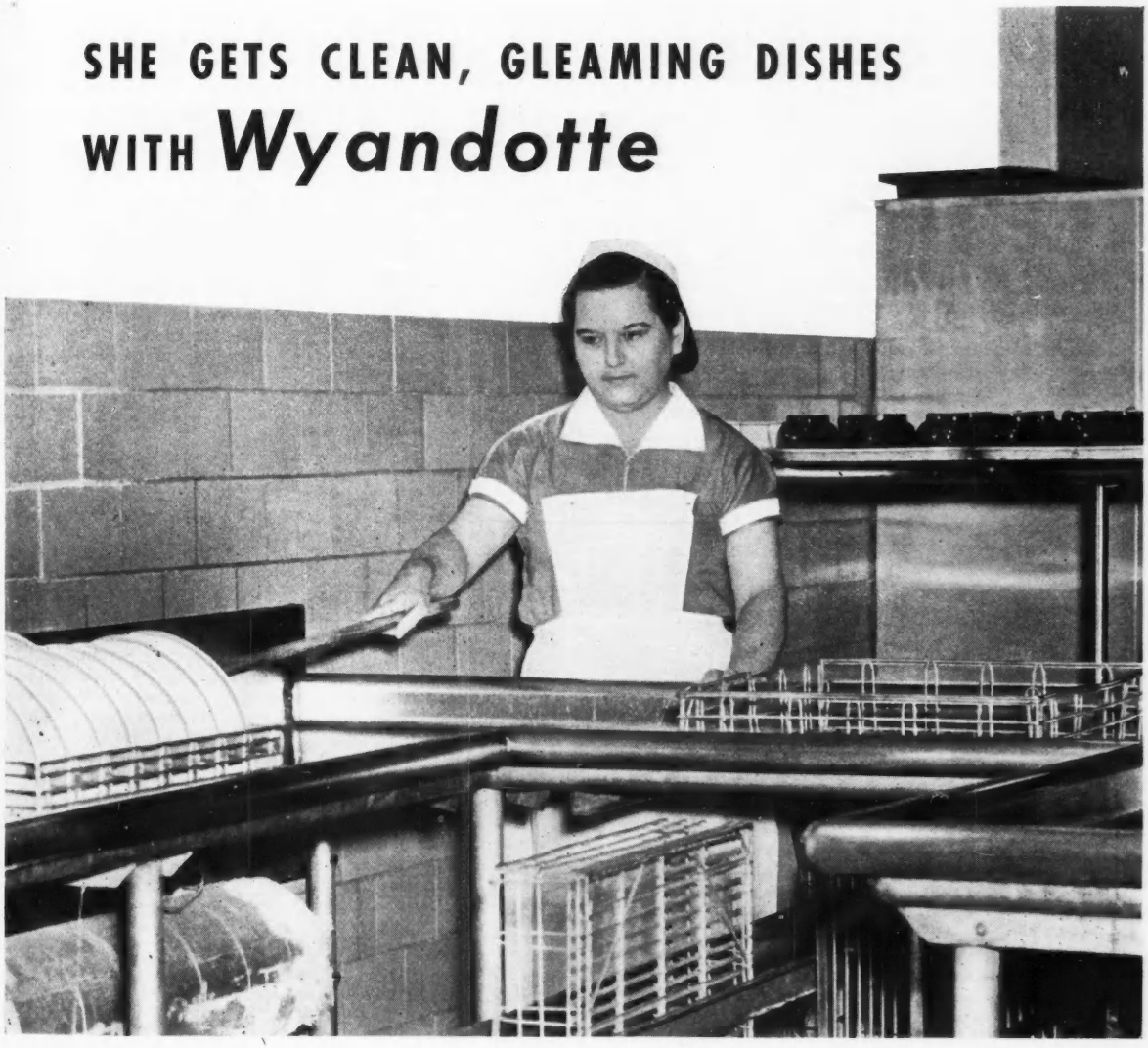

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ues, poverty, and the effect of illness on nutritional status. The best efforts of professional persons in many fields and intelligent cooperation of the public are required to solve the nutrition problem which is so fundamentally affected by cultural, social, and economic aspects of our national life. The important contribution which the practicing physician and the public health worker can make to a national program for better nutrition is discussed and many specific and practical suggestions offered.

Dark Adaptation. If significant regression of the nearly dark adapted threshold in response to vitamin A therapy is used as a criterion of night blindness due to vitamin A deficiency, individuals must be observed serially over a period of time, a procedure unsuited for practical reasons to the study of a large number of individuals. From the latter and previous considerations it appears that threshold measurements may be useful and practicable for the diagnosis of night blindness due to vitamin A deficiency in laboratory or clinical or very small scale field investigations but undependable or impractical in studies of a large population group.

Dental Caries. Among children from well-to-do, and among those from relatively poor families, there are about equal numbers who have few carious teeth and about as many of the one group as of the other have large numbers of teeth that have been attacked by caries. The children of the families of high income receive diets of better quality and quantity and more dental care in the form of fillings and they have fewer teeth extracted. In spite of the fact that the environment of the well-to-do children may be assumed to be more favorable for health than that of the poorer children, yet the clear-cut differences in environmental factors such as diet, housing, dental fillings, and other intrinsic variables seem to produce little difference in the caries susceptibility of the two groups.

Determining Ascorbic Acid in Plasma. The major source of error in low plasma values is that associated with the accidental error in the measurement of dye reduction, and if greater accuracy is desired, independent readings should be made on two or three aliquots of the filtrate.

AMERICAN RESTAURANT MAGAZINE

Vol. 26, April 1942

*U.S. nutrition improving, truck crop sales indicate.—p. 12.
*Industrial feeding—centralized or decentralized. F. Schmid.—p. 28.
*U.S. needs US strong. J. V. Malone.—p. 31.
*The effect of war on food supplies. S. J. Sexton.—p. 35.
*How to conquer noise! C. L. Badley.—p. 40.
*More about New York City's child nutrition project. G. H. Chatfield.—p. 67.

Nutrition Improving. Commercial vegetable production in 1941 was 7% higher than in any previous year, but a 10% further increase for 1942 is requested. The current production figures are especially significant from the nutritional standpoint. Vegetables supplying vitamins and minerals needed in the diet are now being produced and consumed in far larger quantities than 15 or 20 years ago.

Industrial Feeding. The cafeteria and canteen are considered the most satisfactory forms of centralized feeding because of the speedy service and relatively low overhead. Among the fifteen factors to be considered are serving counters, total seating capacity, and sequence of counter facilities. There should be two or three lunch periods to decrease the total dining room space occupied. Most satisfactory circulation is established by bringing employees directly from outside corridors into the serving lines. A continuous conveyor belt for soiled dishes, interchangeable menus placed within view of employees before they reach the serving counter, location convenient to employees' washrooms, and separate checkers and cashiers are recommended.

Strong U. S. Effective nutrition information can be disseminated in restaurants through menu space, table cards, and other advertising media, as well as by the food itself. Restaurant operators must know the fundamentals of nutrition and recognize the fact that nutritious meals can be both appetite-appealing and profitable. It is suggested that a dietitian be consulted with regard to competitive menu planning from a nutritional standpoint.

Food Supplies. A plentiful supply of foods during the next year may be expected at reasonable but higher prices than at present. Ample supplies and a variety of best sellers will still be available, but the serving of some foods may have to be temporarily stopped and the preparation methods changed for various foods.

Conquer Noise. Since noise results in vibration and friction, causing wear on equipment as well as psychological strain, effective measures must be taken toward the elimination of unnecessary noise. Practical steps are the training of personnel to appreciate the harmful effects of noise, installation of rubber pads for dish handling and felt linings in silver trays, kitchen equipment rearrangement and correction of noisy air-conditioning systems.

Nutrition Project. Preparation, packing, and purchasing methods employed in New York City's nutrition project. Project eligibility reports for program control and illustrations of numerous forms used are included in part two of the book condensation, *Child Nutrition, 180,000,000 Lunches.*

CHAIN STORE AGE

Vol. 18, April 1942

*Solving floor maintenance problems. V. G. Kling.—p. 10.

Floor Maintenance. Floor maintenance products must meet the requirements of appearance, safety, and economy. The use of oily mops, water in large quantities, and heavy coats of wax are not recommended. Allow waxes to dry 30 minutes before polishing, and replace wax immediately when the film wears off. Damp mopping of floors should be done at night to avoid accidents. Rubber tile should not be cleaned with strong soap or oil soaps, but with cleansing agents specifically made for rubber tile. Terrazzo is best cleansed by thorough mopping followed by terrazzo sealer. Soap containing caustic alkali should not be used. Animal fats and caustics remove the oil from linoleum, therefore should not be used. Finish materials should not be used on wood floors that have not first been sanded and sealed. Clean asphalt tile floors with water or soap type cleaners and finish with two coats of wax. Do not apply penetrating sealers or spirit solvents.

CONSUMERS' GUIDE

Vol. 8, March 15, 1942

*Rationing is fair play.—p. 2.
*No fat for wasting.—p. 8.

REPLACE OBSOLETE EQUIPMENT WITH NEW BLODGETT BAKING & ROASTING OVENS

From 50 to 75% of the users of commercial baking and roasting equipment are operating obsolete ovens—units that waste fuel, time and money. It's good sense—and a wartime obligation—to check waste, wherever it occurs.

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JUNE 29–JULY 19

Family Adjustment to a War Economy
Food Conservation and Preservation

JULY 21–AUGUST 8

Nutrition and Food Utilization
Clothing Conservation
Curriculum Laboratory

School of Home Economics
DREXEL INSTITUTE OF TECHNOLOGY
Philadelphia, Pa.

Sugar Rationing. Rationing is necessary for equal distribution. Commercial users will take about one-third, restaurants and institutions will have a good share, and some must be held in reserve for home canning needs during the summer. Production of honey, corn syrup, corn sugar, maple sugar and syrup, sorghum and molasses is being slightly increased to substitute for sugar. Most of these have lower sweetening value and more mineral content. Use twice as much corn syrup as sugar in a recipe and cut the liquid requirement one-fourth for puddings, custards, and sauces. In drop cookies, muffins, plain cakes, substitute syrup measure for measure and reduce liquid one-third. Use one-fourth corn syrup and three-fourths sugar in canned fruits and jellies. Corn syrup in frozen desserts improves the texture. In substituting honey for molasses omit soda and increase the amount of baking powder to 1 teaspoon for each ½ teaspoon soda.

Fat Supplies. The U. S. fat production in 1942 is being pushed up all along the line from 3% more butter to 400% more corn oil. War industries will increase oil and fat consumption 1.6 billion lb. over 1940. This means less fat for domestic uses even with increased production. Tests to determine what fat is best for each product will often show that a cheaper fat can be used just as well as a more expensive one. Meat drippings can be clarified to remove objectionable odors, tastes, and colors by melting the fat with an equal volume of water, heating at a moderate temperature for a short time, stirring occasionally, cooling until congealed fat can be lifted from water surface. Both restaurants and homemakers should cut smaller pats of butter to eliminate leftovers. To cut down on fat waste when measuring, if ¼ cup of fat is called for, fill cup ¾ full of cold water and add fat until cup is full.

FOOD INDUSTRIES

Vol. 14, April 1942

*How some companies are meeting their packaging problems.—p. 36.
*Glass containers simplified to save scarce materials.—p. 44.
Wrappers tested for moisture loss. G. W. McBride.—p. 46.
*Foods that may be packed in tin.—p. 49.
*Acid detergent makes cans more sanitary. F. M. Scales.—p. 51.
*System is the key to controlled quality. W. R. Van Meter.—p. 54.
*What's known today about dehydrating vegetables. W. V. Cruess and E. M. Mrak.—p. 57.
*Pictures of processes.—p. 60.
*Data and regulations on use of egg yolk. B. I. Masurovsky.—p. 65.
*Answers to food law questions.—p. 77.
*Prices still increase.—p. 80.
*Acid detergent.—p. 90.

Substitute Packages for Foods. Adoption of plans for standardized shapes, sizes and weight in glass containers will conserve glass. New tops for glass containers of black iron, specially treated paper liners, and composition gaskets substitute fairly well for aluminum, tinplate, liners of cork or foil, and rubber gaskets. Heavy waxed paper containers are excellent for foods that do not need heat sterilization, but supplies of high grade paper and wax are becoming scarce. Combination metal and paper containers are proving useful. Paper boxes and folding cartons lined with laminated sheets of high-moisture-proof quality, or treated glassines and vegetable parchments are proving serviceable substitutes. Paper bags are substituting for burlap. Wax paper and glassine wrapping and some cellophane are still available for food packaging.

Standardized Glass Containers. Developing a standardized range in size, shape, and weight of glass containers should require the manufacture of 25 to 30% less glass. Specifications have been drawn up for the economy line plain round jar by the Glass Container Association. Based on the ratio of jar width to height, it is expected that a saving of 20 to 40% on materials used for closures will result.

Foods Packed in Tin. Except for minor limitations, the following foods may be packed without restriction on the amount of tin or the number of containers required: fruit cocktail and fruits for salads; peaches; pectin; citrus fruit concentrates; asparagus; beans; corn; peas; tomatoes; baby foods; fish and shell fish; cold pack foods; evaporated and dried whole milk; special dietary products; honey; and dehydrated vegetables. All quantity limitations relate to the size of pack and refer to the entire year. Degree of limitation is figured as a percentage of the 1940 pack. Canned fruits range between 75 and 100% except for plums and rhubarb which are limited to 50%. All tomato products are allowed 100%. Other vegetables range from 50 to 100%, pimiento, squash, pumpkin, and sauerkraut being in the low range. Condensed soups are allowed 100%, but canned soups are cut to 25% with no packing after June 30. Corned beef, boned chicken and turkey, and chili con carne are permitted 100% pack; chopped luncheon meats, bulk sausage, and potted luncheon meats in cans of 12 oz. or over, 125%; other meat products, about 75%; and fish and shellfish, 100%. Condensed, malted or evaporated milk, liquid or hard oils and fats, sweet syrups, and frozen and storage cream are allowed 100% pack.

Acid Detergents for Milk Cans. Using acid instead of alkaline detergents in washing milk cans greatly cuts the possibility of bacterial contamination of the milk from the can, and gives promise of making cans absolutely sterile. Acid detergents remove milkstone deposits, and when followed by blasts of hot air result in perfectly dry surfaces and entirely odorless cans. The corrosion is 11.7 times less than that produced by alkaline solutions. Tests show a saving of 42% on the cost of detergent, and approximately 20% on the cost of coal.

Controlled Quality in Food Production. Factors controlling quality are: quality of raw materials, uniformity in production processes, and laboratory research. Maintenance of a laboratory is important so that uniformity of raw materials can be tested and the final products tested weekly according to set standards. Production control should be advanced beyond mere methods of procedure to fine points such as the temperature of the mixing room, the temperature of the ingredients as they are mixed, and the density of the finished batter or mixture. As much daily tasting as possible of the products is necessary to maintain standards of flavor in edible products.

Dehydrating Vegetables. Here are specific directions for preparing vegetables for drying. Green beans: shell, sort out beans, blanch 8 to 10 min., dehydrate at 150° F. to less than 5% moisture. Jerusalem artichokes: peel, hand trim, slice, tray at 1.5 lb. per sq. ft., steam 4 min., dehydrate at 160° F. to a moisture content not to exceed 5%. Mushrooms: peel only large ones, cut off woody stems, blanch 5 to 10 min., dehydrate at 150° F. to not less than 4% moisture. Onions: are either dehydrated as a powder or in slices; if to be sliced, remove outer layers, trim off ends, slice thin, tray at 1.25 lb. per sq. ft., blanch ½ to 1½ min., dehydrate at 140° F. to 3% moisture. Okra: sort pods, wash, trim, slice crosswise into slices ⅛ to ¼ in. thick, spread on tray 1.23 to 1.5 lb. per sq. ft., steam 4 to 8 min., dry at 150° F. to 5% moisture. Peas: shell, spread immediately on tray 1 lb. per sq. ft., blanch 5 to 10 min. in live steam, dry bone dry to less than 5% moisture at not above 150° F. Peppers and pimientos: dry to powder; never blanch; dry by heated air at 180° F. Potatoes, white: peel, hand trim, slice ⅛ to $\frac{3}{16}$ in. thick, spread on trays and wash with cold water to remove starch, load about 1.25 lb. per sq. ft., blanch in steam until cooked, 5 to 7 min., dehydrate at 150° F. to 5% moisture. Potatoes, sweet: peel, steam 20 to 30 min. and dehydrate at 130 to 165° F. to 10% moisture. May dip in dilute citric acid to prevent darkening. Pumpkin and winter squash: remove seeds and fiber, shred meat to ¼ in. thick, dry bone dry at 160° F. Sauerkraut: prepare

Q. Now, Doctor, from your point of view, just what is canning?

A. Well, to me canning is something more than just another method of food preservation; it is one of the important means whereby many foods essential for proper nutrition are made readily available to Americans in all localities during all seasons of the year. (1)

American Can Company, 230 Park Avenue, New York, N. Y.

(1) 1939. The Canned Food Reference Manual, American Can Company, New York.
1938. Commercial Fruit and Vegetable Products, Second Edition, W. V. Cruess, McGraw-Hill, New York.
1937. Appertizing or the Art of Canning; Its History and Development, A. W. Bitting, Trade Press-room, San Francisco.
1936. A Complete Course in Canning, Sixth Edition, Press of "The Canning Trade," Baltimore.

ACCEPTED AMERICAN MEDICAL ASS'N Council on Foods

The Seal of Acceptance denotes that the nutritional statements in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

as usual, drain, steam 10 to 15 min., dehydrate at 150° F. to less than 5% moisture. Spinach, kale, greens of any sort: trim, wash thoroughly, spread on trays at 0.5 lb. per sq. ft., steam 3 to 5 min., dehydrate at not above 150° F. to less than 4% moisture. Inject steam into cool air to give 90 to 95% humidity to prevent brittleness in final product. Summer squash: trim, peel, slice ¼ in. thick, tray at 1.5 lb. per sq. ft., steam 6 to 8 min. and dehydrate at 150° F. to less than 5% moisture. Tomatoes dried in slices: dip in boiling water to loosen skins, chill in cold water, peel, core, slice ¼ in. thick, spread on trays one layer deep, and dehydrate at not above 150° F. to less than 5% moisture. May be steamed 2 to 3 min. Yields on dried vegetables per 100 lb. fresh product are: green pod beans, 10 to 13 lb.; cabbage, 8 to 12; carrots, 11 to 14; celery, 6 to 9; corn, 25 to 28; onions, 12 to 15; parsnips, 18 to 22; peas, 18 to 22; white potatoes, 22 to 25; pumpkin, 7 to 9; squash, 11 to 14; spinach, 7 to 11; sweet potatoes, 32 to 33; tomatoes, 5 to 8; turnips, 11 to 12.

Bacon Processing. Swift's Premium bacon has a history. Careful weighing and determinations of size and ratio of lean meat to fat are carried out to grade the quality and to decide the kind and length of cure for each piece of meat. Layered in a 3 by 5 by 3 ft. paper-lined and covered corrosion-resistant metal box, the meat is dry-cured in a mixture of table salt, sodium nitrate and sugar for 20 to 40 days at 36 to 38° F. The curing mixture is sprinkled generously between layers on the fleshy sides of the meat. After being trade-marked, sides are hung on racks that travel into a smokehouse where meat is subjected to filtered, hardwood smoke for 20 to 36 hours at 115 to 145° F. It is then sterile with respect to molds, yeast, and common bacteria, and is chilled before slicing in a washed-air room.

Regulations for Use of Egg Yolks in Ice Cream. Egg yolk solids in ice cream give valuable nutrients, desirable emulsifying agents, and rich flavor that makes the use of less sugar possible. Egg yolks may be added either dry or frozen. The Food and Drug Act rules that for French ice cream 5 doz. egg yolks should be used per 90 lb. other ingredients. But the size of egg yolks affects their weight, and to be thoroughly specific this ruling should change the term "dozen" to "pounds of egg yolk solids" to each 90 lb. ice cream mix. Studies show that to meet this equivalent in dried egg yolks the ratio would be 1.36 lb., containing not less than 95% total egg yolk solids, and for frozen egg yolk, the required amount would be 3 lb., containing not less than 43% egg solids. These amounts will vary from 6 to 8 dozen egg yolks.

Food Laws. In the labeling of any wheat germ oil or products represented as having vitamin E activity and offered for human use, consideration must be given to section 201 (n) of the Food, Drug and Cosmetic Act and the regulations thereunder, and to the dietary food labeling regulations published in the Federal *Register*, November 22, 1941. The Food and Drug Administration holds that foods containing saccharin in any proportion are adulterated, unless they are for special dietary uses and comply with dietary food labeling regulations.

Prices Still Increase. During the month of February 14 to March 14 the weekly index of commodity prices rose from 100.4 to 101.1. The index for food commodities rose from 98.4 to 99.5. Retail prices of foods show only slight increase in recent weeks, but wholesale food prices advanced from an index of 93.7 on February 7 to 95.8 on March 7. Spot prices of foods showed less variation than usual during this period.

Acid Detergent. An acid cleanser for equipment used in dairy industries particularly is marketed under the name "Mikro San."

FOOD RESEARCH

Vol. 7, March–April 1942

*Riboflavin content of some common foods. H. E. Munsell.—p. 85.

*Staphylococci and salmonella control in foods. III. Effect of chocolate and cocoa fillings on inhibiting growth of staphylococci. W. H. Cathcart and A. Merz.—p. 96.

*Staphylococci and salmonella control in foods. IV. Effect of cooking bakery custards. W. H. Cathcart, A. Merz and R. E. Ryberg.—p. 100.

Relation of volume of daily milk production to ascorbic acid content of cow's milk. A. D. Holmes, F. Tripp, E. A. Woelffer and G. H. Satterfield.—p. 111.

*Ascorbic acid content of seven varieties of Muscadine grapes. T. A. Bell, M. Yarbrough, R. E. Clegg and G. H. Satterfield.—p. 144.

*Palatability and histological changes occurring in New York dressed broilers held at 1.7°C. (35°F.). H. L. Hanson, G. F. Stewart and B. Lowe.—p. 148.

Riboflavin Content of Foods. The highest value for riboflavin content was obtained with Cheddar cheese. Dried legumes were also an excellent source. Milk, beef muscle, pork muscle, and fish (salmon) muscle each assayed more than 200 micrograms per 100 grams. Different values were obtained for samples of eggs purchased at different times which is in accordance with the findings of others regarding variation in the riboflavin content of eggs. Among the green leafy vegetables spinach and the leaves of broccoli gave very high values in parallel with their greenness. They were intermediate between the values for cheese and those for the dried legume. The values for green string beans, fresh green peas, and endive are similar to those for milk and muscle meats. The less green leaves of cabbage and lettuce gave very low values. Green pepper presents an anomaly since the value obtained for it is similar to that for cabbage and lettuce although in degree of greenness it is more like spinach and broccoli. Roots and tubers seem to be uniformly low and cereals are intermediate.

Staphylococci Control. Natural chocolate and natural cocoa fillings made by the formula given have a definite inhibiting action on the rate of growth of *Staphylococcus aureus*. The *p*H of the fillings and a substance or combination of substances in chocolate and cocoa, probably located in the non-fat part of the chocolate and cocoa, are responsible for this inhibiting action.

Staphylococci Control. The data show that the commercial procedure for custard pies is sufficient to kill both staphylococci and Salmonella organisms.

Ascorbic Acid Content of Grapes. On the basis of adult needs, 70 to 75 mg. ascorbic acid daily, 2½ lb. Scuppernong grapes would be necessary to meet the need. The average ascorbic acid content of the Scuppernong is 35 times as great as the average for the Hopkins and the skins contain 3 times as much ascorbic acid as the edible portion.

Broilers. When New York dressed broilers were spray-cooled and stored at 1.7° C. (35° F.), the first decrease in aroma and flavor scores occurred after 40 hours. In general, this decrease continued thereafter with increase of storage time before cooking. Tenderness increased with storage until approximately 3 hours. Juiciness was unaffected by time of storage. The greatest decrease in the desirability of the aroma and flavor of the liver occurred after 20 hours' storage.

ICE CREAM TRADE JOURNAL

Vol. 38, April 1942

*War rulings affecting the ice cream industry. B. Terhune.—p. 24.

*Conserving chocolate coating. J. H. Erb.—p. 28.

War Rulings. Sugar rationing for the ice cream industry means 80% of that used in 1941. A saving of 550,000 tons of sugar is expected if a plan for substituting grain for molasses as a base in industrial alcohol manufacture can be carried out. Good news for the ice cream industry is the increased preference rating for iron or steel products used in the manufacture of non-metal containers such as paper cartons. The sale of ice cream sodas will be seriously affected if the proposed excise tax of 80¢ per pound of carbonic gas used in unbottled soft drinks goes into effect.

Chocolate Coating. Since the supply of cocoanut oil

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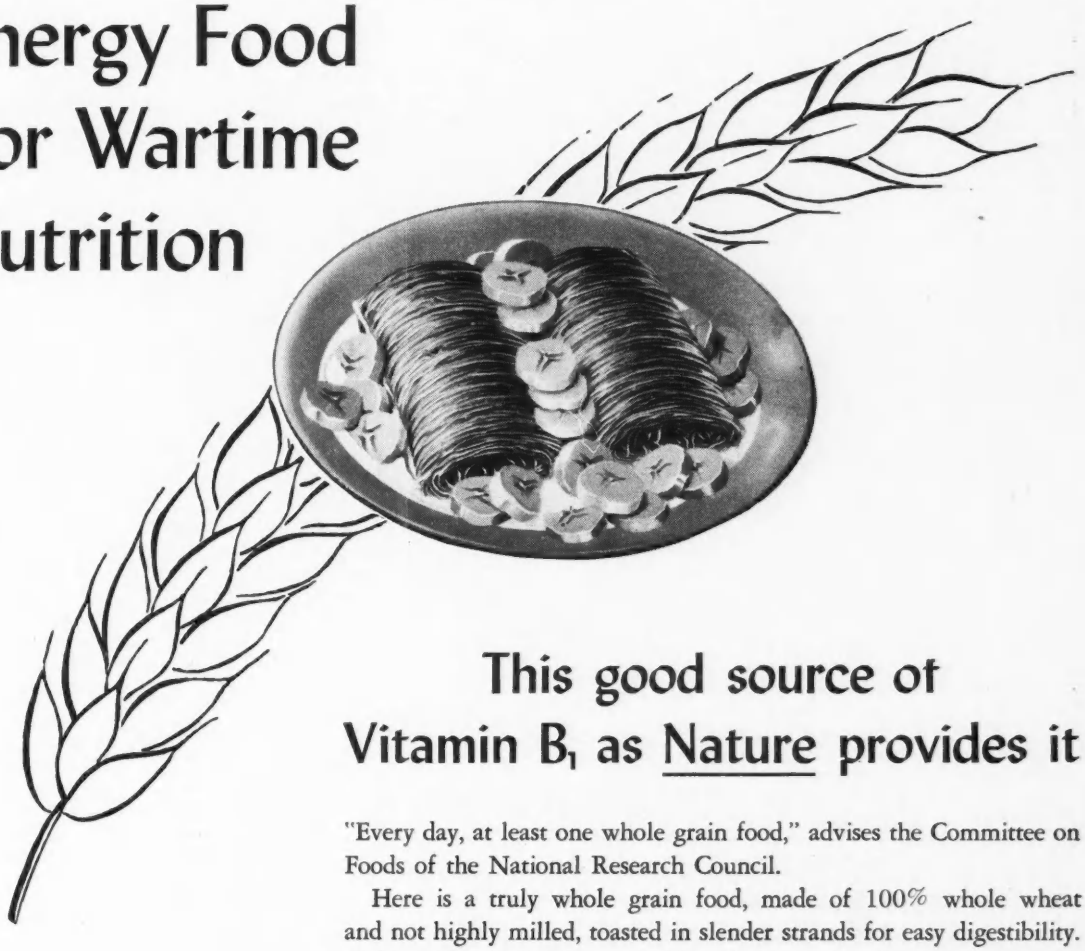

This good source of Vitamin B_1 as Nature provides it

"Every day, at least one whole grain food," advises the Committee on Foods of the National Research Council.

Here is a truly whole grain food, made of 100% whole wheat and not highly milled, toasted in slender strands for easy digestibility. Nabisco Shredded Wheat supplies *all* the energy of whole wheat and, in addition, is recognized as a good source of Vitamin B_1 as *Nature provides it.*

The keen, toasted, nut-like flavor of Nabisco Shredded Wheat "wears well," and in many homes it is a standard breakfast. With milk and berries or fruit it affords a well-rounded supply of nutrients—vitamins, minerals, carbohydrates and proteins. Yet it is not too hearty a morning meal even for sedentary workers.

In recommending Nabisco Shredded Wheat, recognized for more than 45 years as an ideal whole grain cereal, it is well to mention the full name, Nabisco Shredded Wheat, which is the original Niagara Falls product.

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used for "pail" coating ice cream bars has been cut off, slab coating with pure chocolate will become necessary, but the industry is able to obtain only 80% of the chocolate received in 1941. For a satisfactory slab coat: prevent thickening due to moisture, use coatings containing lecithin, standardize the fat content of the coating to between 55 and 60%, use a properly milled coating that is smooth and free from agglomerates, keep the temperature below 115° F. for milk coatings, and keep the temperature of coating and ice cream uniform during the dipping period.

JOURNAL OF HOME ECONOMICS

Vol. 34, April 1942

Homemaking departments geared to family living. M. Spicer.—p. 227.
*Sound films for home economics. D. S. Lewis.—p. 235.
*Butter and margarine. R. M. Leverton.—p. 240.
*Conference on maternal and child health. G. Wyckoff.—p. 241.

Vol. 34, May 1942

*Consumer shortages and the cost of living. F. M. Williams.—p. 288.
*Ascorbic acid content of five quick-frozen vegetables. J. A. McIntosh, D. K. Tressler and F. Fenton.—p. 314.

Sound Films. A wide variety of sound films is now available to the home economics teacher. Government agencies offer "For Health and Happiness"; "Food Makes a Difference"; "The Plough that Broke the Plain"; "The River"; and "Three Counties Against Syphilis." The Metropolitan Life Insurance Company provides "Alaska's Silver Millions"; "Meat and Romance"; "The Romance of Rayon"; and "She Saves Who Sews." Documentary films produced in England portraying actual life situations for analysis and interpretation are "Tomorrow is Theirs"; and "The Village School." To improve the dietary practices of the family, New York University has produced "And So They Live" and "The Children Must Learn."

Margarine. Butter contains an average of two and one-third times as much vitamin A as do fortified margarines while margarine costs only one-half as much as butter. The leafy green or yellow vegetables and liver, however, are far more economical sources of the vitamin. Because of the low price of margarine, it is commendable to save the money formerly spent for butter and use it to purchase protective foods that add to the nutritive value and variety of the daily meals.

Health Conference. To extend maternal and child health services to counties not now adequately serviced requires an organization for locating needs and a personnel capable of meeting these needs. One national agency cannot handle the problem. Coordinated efforts of more than one group are essential. Since the organizations must work with and not for the people, primary problems involved are concerned with the development of community responsibility and with persuading the people to want what they should have.

Food Shortages. It is said there will be no general shortage of food in 1942. Limitations on fishing activities will probably bring a reduction in the 1942 pack of salmon. The use of haliver oil, shark oil, and percomorph (a combination of fish oils) and ergosterol will supplement the cod-liver oil supply. The supply of flavoring oils, crab meat, spices, will probably be below average, and many of us "who are devoted to our cups of tea may have to depend largely on coffee."

Ascorbic Acid Content of Vegetables. The composition of the cooking utensil had very little effect on the ascorbic acid content of boiled quick-frozen vegetables. The amount of ascorbic acid leached from vegetables varied with each vegetable but was quite constant for each vegetable as regards the composition of the cooking utensil: from 12 to 15% of the ascorbic acid was leached from Brussels sprouts, 23 to 29% from cauliflower, 20 to 28% from peas, 24 to 28% from spinach, and 31 to 36% from Lima beans. With few exceptions the ascorbic acid retention in the vegetables investigated was the same, within the limits of error of the method, whether boiled in covered or in uncovered utensils. Quick-frozen cauliflower, Lima beans, and peas lost increasing amounts of ascorbic acid to the cooking water as the volume of the water in which they were boiled was increased.

PERSONNEL JOURNAL

Vol. 20, March 1942

*Women personnel executives: I. General. M. E. Owens.—p. 298.
*The drives of workers. H. A. Wren.—p. 317.
*Fitting workers to jobs. C. L. Shartle.—p. 328.

Women Personnel Executives. A survey in which 53 service, retail, and manufacturing concerns participated suggests that the personnel director should have at least a bachelor's and preferably a master's degree. She should participate in extracurricular school activities, especially those involving executive and administrative responsibilities. She should have an aptitude for handling all types of personalities, good health, the courage of her convictions, a sense of discrimination and tact, and a secretive personality.

Drives. There are certain psychological drives which make an individual aspire to higher vocational levels: vocational status level, abilities, education, familiar occupations, and the securing of power, prestige, or more money. Other characteristics seem to have no bearing on aspirations: age, marital status, employment stability, abilities not identified with the goal, and the extent of supplementary education.

Job Analysis. Analyses have been made of the knowledge and abilities required for each job and aptitude tests developed for the purpose of determining which applicant will best fill a given position. One of the chief contributions of occupational research has been the development of "job families"; that is, the grouping of related vocations. This development has been in 3 fields: occupational classification, occupational information, and worker analysis.

RESTAURANT MANAGEMENT

Vol. 50, April 1942

*33 ways for a steward to make "food cost." S. Mallick.—p. 6.
*Cost per serving chart.—p. 10.
36 cost-cutting posters.—p. 22.
*Carving ribs of beef.—p. 28.
How to get the most from your deep fat fryer.—p. 35.
30 ways to reduce refrigeration costs. F. D. Mosher.—p. 40.

Making "Food Cost." Mallick suggests 33 cost-cutting procedures, among which are the following: Know your markets and purchase seasonable foods. Buy with a knowledge of transportation rates. Buy on future when possible. Contract for dairy products at not more than .02% over Chicago and New York markets and eggs at not more than .05%. Have written requisitions signed by department heads for all store-room issuances and keep a perpetual inventory. Keep ice boxes under lock and key. Steward should keep chef informed of market values and steward and manager should consult on market conditions and food quality.

Cost Per Serving. Chart gives the cost of canned foods per dozen, the number of portions per can, and the costs per portion.

Carving Beef Ribs. Run point of boning knife around small vertebra bones and pry off bones. Stand roast on end and cut off top including first two ribs for well-done orders. Place roast with rib side to carver's left and hold firmly in place with flesh fork inserted between two top ribs. Cut from outer edge in toward rib bone. Keep surface of slices even. Cut meat away from rib bone by running knife point along the bone.

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V-C-B is a water soluble powder, which, when dissolved as directed, produces a pleasant fruity beverage approximating the caloric value and Vitamin C potency of fresh orange juice. The standard cost is only 54¢ a gallon, of which a 4-oz. liquid portion provides individual daily requirements (1000 International Units) of Vitamin C and 50 calories. Valuable also for fortifying fruit juices and beverages with Vitamin C.

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V-C-B and all advertising claims for it are accepted by the Council on Foods of the American Medical Association. Because of its recognized advantages many State Institutions have adopted V-C-B as a standard for administering Vitamin C. These institutions are saving hundreds of dollars yearly with V-C-B. Similar savings can be brought about in your institution through use of V-C-B. If you have not tried V-C-B, send for free sample and complete information TODAY.

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PUBLIC HEALTH NURSING

Vol. 34, March 1942

* The rural school child's lunch. C. M. Leamy.—p. 135.

Rural School Lunch. The rural schools of Maryland have worked out nutrition programs based on their own needs and resources. A survey of 1169 daily intake records of school children in one county showed that 32.8% of the children had no milk; 50%, no vegetables; 59%, no whole grain cereal; 57%, no fruit; and 2.6%, no meat or meat substitute.

SCIENCE

Vol. 95, March 6, 1942

* Consideration of the adequacy of biomicroscopy as a method of detecting mild cases of vitamin A deficiency. E. C. Callison.—p. 250.
* Some factors in the nutritional determination of history. F. Hoelzel.—p. 251.

Vol. 95, March 13, 1942

* Physiology of the amino acids. D. D. Van Slyke.—p. 259.
The effect of insulin on pyruvic acid formation in depancreatized dogs. E. Bueding, J. F. Fazenkos, H. Herrlich and H. E. Himwich.—p. 282.

Vol. 95, March 27, 1942

* The occurrence of fits in pyridoxine deficient rats. S. Lepkovsky, M. E. Krause and M. K. Dimick.—p. 331.

Vitamin A Deficiency. Further investigation of conjunctival and corneal changes should be made on subjects with uncomplicated experimental vitamin A deficiency before complete reliance is placed in the biomicroscopic examination as a routine method of detecting mild cases of vitamin A avitaminosis.

Nutritional Determination of History. A nation or culture can develop only when or where a sufficient supply or surplus of food becomes available. Conversely, too much food or an excessive catering to the appetite can wreck an empire. It may be of more importance in America to guard against the insidious effects of dietetic excesses among the "well-fed millions" than to concentrate on raising the nutritional standards of the extremely poor. Deficiency diseases may often be excess diseases due to excessive intakes of carbohydrates, fats, and/or proteins. A sufficiently keen appetite is about all that is needed to lead one to choose an adequate diet. Appetite can best be kept keen by occasional periods of voluntary food restriction or fasting.

Amino-Acids. Amino-acids are concentrated by some unknown mechanism in the tissues to many times their concentration in the blood plasma. Some can be transformed into one another in the body or synthesized from ammonia and keto-acids. Others must be made by plants, bacteria or other organisms which have greater synthetic powers than the human being. After the amino-acids have entered the tissues, they may be destroyed and their nitrogenous parts turned into urea in the liver; their carbon fractions may be used to form glucose; they may sacrifice themselves to protect the body from toxic products; they may serve as source material for certain vitamins, hormones and other compounds; or they may enter into the proteins of the tissues and become part of living body for a time.

Fits in Pyridoxine Deficiency. Fits will occur in pyridoxine-deficient rats. The disturbed water metabolism may be involved.

Vitamins in the Vittles

The word vitamins these days is in everybody's mouth, but not the vitamins themselves. U. S. workmen, as a class, do not get enough. The first hardheaded, scientific program for giving U. S. workers enough vitamins appeared in a little booklet published by the National Research Council last fortnight (*The Food and Nutrition of Industrial Workers in Wartime*). The booklet would make interesting reading for two kinds of people, neither of whom sufficiently appreciates the merits of fresh fruits, meats and vegetables: housewives who pack lunch pails and the factory managers who install cafeterias. Points:

According to a recent survey by the National Association of Manufacturers, only 41% of more than 2,000 plants have cafeterias for their employes.

"All cafeterias, kitchens, lunch stands, etc., should be under plant management and run on a non-profit, non-loss basis. . . . Cafeterias, rolling kitchens, or lunch stands operated by concessionaires . . . [are] generally less satisfactory than management-owned cafeterias." Reason: "Candies, pies, cakes and soft drinks are apt to constitute too great a proportion of their stock."

First essential for a company cafeteria is a well-trained dietitian. ("Very few" plants employ them.) Efficiency experts can determine the amounts of money spent in the cafeteria by each employe who lunches there; the dietitian, through shrewd marketing, can plan well-balanced menus within the price range.

Any meal served in a plant should contribute at least one-third of the worker's daily food requirements, which are: at least one pint of milk; two helpings of potatoes; two helpings of fruit, one a citrus fruit or tomato; two vegetables, one leafy, green or yellow; one egg; one helping of meat, fish or poultry; a cereal dish (whole grain); whole-grain or enriched white bread at every meal; and butter or fortified oleomargarine.

"The practice of serving food between meals to workers has given good results and is recommended." Snacks should include milk or tomato juice, whole-wheat or enriched bread.

If possible, workers should be encouraged to have vegetable gardens, either at home or on company-owned property.

All food served to workers, whether in near-by hash-houses or company cafeterias, should be rigidly supervised by local health authorities.

—*Time, May 25, 1942*

BANANA OATMEAL COOKIES

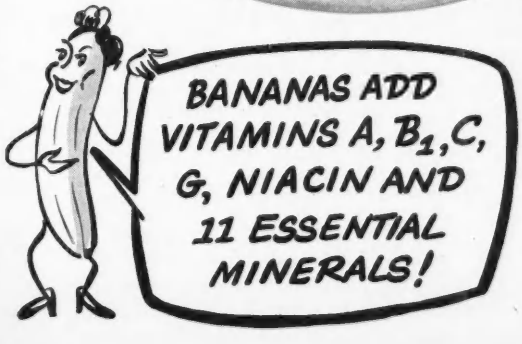
Scaling weight for 1 dozen cookies: 10 ounces	8 pounds 4 ounces mixture 13 dozen cookies	16 pounds 14 ounces mixture 26 dozen cookies
INGREDIENTS	AMOUNTS OR WEIGHTS	AMOUNTS OR WEIGHTS
Flour	1 pound 8 ounces	3 pounds
Salt	½ ounce	1 ounce
Cinnamon	⅛ ounce	½ ounce
Nutmeg	1½ teaspoons	¼ ounce
Soda	2 teaspoons	⅜ ounce
Shortening	1 pound 8 ounces	3 pounds
Sugar	1 pound 8 ounces	3 pounds
Bananas*, pealed	2 pounds	4 pounds
Eggs	5 (8 ounces)	10 (1 pound)
Rolled oats	14 ounces	1 pound 12 ounces
Nut meats, broken	8 ounces	1 pound

**Use fully ripe or all-yellow bananas*

Sift together flour, salt, spices and soda. Cream shortening and sugar until light and fluffy. Add bananas and beat until they are thoroughly mashed. Add eggs gradually, beating well after each addition. Add rolled oats and nut meats and blend. Add flour mixture and beat just enough to blend. Drop on ungreased cooky sheets and bake in a moderately hot oven (400°F.) about 15 minutes, or until cookies are done. Remove from pans at once.

● Here's dessert with a difference! Fresh fruit cookies with valuable vitamin-mineral content and a new delicious flavor! Serve them to patients or staff . . . they're sure to be popular.

"THEY STAY FRESH AND MOIST!"



FREE SET OF 50 BANANA RECIPES

Fruit Dispatch Company, Home Economics Dept.
Pier 3, North River, New York City

Please send me free your set of tested banana recipes and suggestions in quantity proportions, printed on handy 4 x 6 file cards.

Name_____

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UNITED FRUIT BANANAS *distributed by* **FRUIT DISPATCH CO.**

J. A. D. A. 6-42

News Notes

Progress in the National Nutrition Program. Judged by material which has recently come in to the JOURNAL office, many interesting conferences have been held and projects are underway in which dietitians are participating over all the United States. One such, a second annual consumer conference, entitled "Nutrition and National Health," was held in affiliation with the Better Business Bureau in Los Angeles. Among the interesting exhibits was one prepared by the California Dietetic Association on Planning Your Meals; Diets for All Incomes, by the California Dairy Council; and The School Lunch Program, by SMA and WPA. Such topics as "What Do We Mean By Nutrition?" "Eat for Health and Happiness," "What the Consumer Should Know about Vitamins," and "Soil and Nutrition" were presented by authorities. In connection with the last mentioned topic, Dr. David Appleman referred to the plant, soil and nutrition laboratory at Ithaca, New York, the staff of which is manned by soil technologists, plant physiologists, nutritionists, home economists, and physicists. Dr. Appleman believed that agricultural production must be dovetailed with human physiological needs if we are to move toward the ideal of a better-nourished nation.

An excellent "handbook on organization" has been prepared for a county nutrition program by the Indiana State Nutrition Council and the Indiana State Defense Council. Among the members of the advisory committee of the Indiana State Nutrition Council, who assisted in the preparation of the handbook are: Dr. Cecelia Schuck, Purdue University, Lute Troutt, Indiana University Hospitals, and Estelle Nesbitt, Indiana State Board of Health, prominent members of the American Dietetic Association. The book outlines the national nutrition program, the state program, and finally gives a detailed description, with organizational chart, of the county nutrition program. In discussing the membership of the county nutrition committee, the bulletin states that membership should not be confined merely to women, since in many instances the men in the community are just as much interested in nutrition activities as are the women. It is also suggested that civic, educational, professional, commercial and other organizations to be represented on the committee should be allowed to select their own delegates so that they would thus be more anxious to cooperate. Members of the county nutrition advisory committee should include the following: county health officer, county welfare director, county agricultural agent, county superintendent of schools, county medical society representative, dental representative, and others if necessary. Subcommittees as listed in the handbook are: Local Organization, Nutrition Courses, Schools, Restaurants, Gardens, Surplus Commodities, Information, Speakers' Bureau, and Exhibits. The primary function of the last-named subcommittee is the stimulation of county groups to build exhibits on nutrition. The making of small wood exhibits, posters and photographs comes within its jurisdiction. It is suggested that volunteer photographers, in many instances, will be happy to cooperl ate with members of the committee in preparing specia nutrition photographs for exhibits and that schools can prepare nutrition posters and assist in making special exhibits.

A copy of the handbook, together with a pamphlet entitled "Building America Through Nutrition," describing the importance of the state and national nutrition program, was sent to each county nutrition chairman who was urged to set up a working organization according to the plan outlined.

A booklet entitled "A Community Nutrition Program" has been prepared under the direction of the Iowa City Nutrition Study Group, made up of homemakers. Part I gives the detailed program developed by the Home Economics Department of the State University of Iowa and presented by ward demonstrators at a series of ward meetings in Iowa City. Part II presents lessons developed by the Iowa City Nutrition Group as a sequel to the Johnson County short course, originally developed by Dr. Sybil Woodruff and her staff at the State University of Iowa. The women who gave the demonstrations described in Part II of the booklet furnished the materials, and prepared the food which was later sampled and discussed by the audience. The booklet's publication was financed by local organizations and business firms in order that it might be sold as a Red Cross project. Dr. Kate Daum, State University Hospital, cooperated in preparation of the booklet and contributed a lesson on corrective diets. Instructive charts, including a vitamin chart, a "guide to good eating" illustrating in color the national nutrition yardstick, a home canning calendar, and a food chart giving food values of average servings, are clipped to the back of the booklet and included in the price, which is 60 cents postpaid.

Dietitian members of the Johnson County (Iowa) Nutrition Committee have also prepared some mimeographed sheets of suggestions for planning the school lunch. These include essential elements of an adequate lunch, suggestions for supplementing the "carried lunch," as well as specific recipes for sandwiches and desserts suitable for the latter type of lunch.

"School Lunch Rooms Using Surplus Commodities" is the title of a multigraphed bulletin prepared under the direction of the New Jersey State Nutrition Council by a special committee headed by Alberta Dent, New Jersey College for Women. This study of the school lunch programs of several elementary schools throughout New Jersey gives information such as the following: Enrollment, number of students eating the school lunch, equipment, cooperating groups, successful dishes or specials using surplus foods, advantages of serving hot lunches, and problems encountered. Several recipes using surplus foods are added at the end of the bulletin.

An unusual study course in nutrition has been received from Constance C. Hart, Board of Education, Rochester,

Marie Gifford Presents

SOME USEFUL INFORMATION ABOUT ARMOUR'S STAR SAUSAGE

Sausages are very popular meats these days... and their popularity is growing because of their economy, convenience and concentrated food value. They make an important contribution to the Health for Victory program.

Armour makes 200 different types... ready-to-serve fresh sausage ... prepared loaves... fancy dry and semi-dry sausage . . . to suit every taste.

And that's why I want to give you a brief digest of data about them.

1. Armour sausages are prepared under strict quality controls.

Sausage-making formulae are developed in our central experimental kitchen, to determine the best methods for quantity production.

Meats used have passed Government inspection for wholesomeness . . . All equipment used is steam sterilized daily, and rigid sanitary inspection is routine.

Every step in processing has been worked out to meet the particular problems of producing each type of sausage . . . to get the right degree of flavor, tenderness, moisture or dryness, and texture required.

2. Armour Sausage kitchens are located throughout the country so that delivery can be made to dealers *in one day*. This prompt delivery insures a constant fresh supply to consumers.

3. Star Sausage products are good sources of complete proteins, certain minerals and the Vitamin B factors. Dry and Semi-Dry varieties are especially concentrated in food value.

4. Armour Sausages are ready to eat and all meat.

5. Armour Sausages are thrifty. No bone—no waste—no time for preparation.

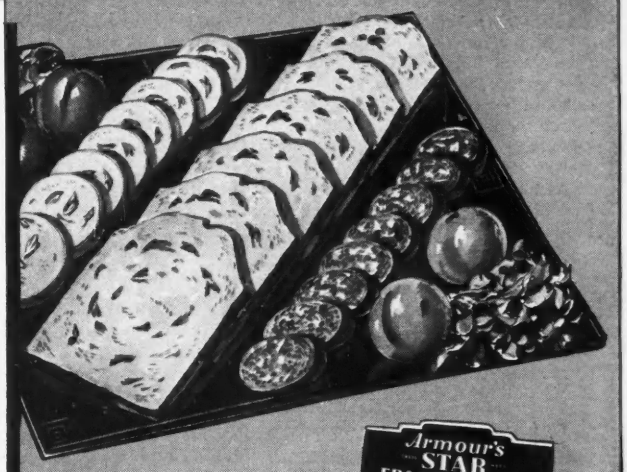
6. These Armour Sausages are versatile meats... add new zest to virtually every meal . . . at very reasonable cost.

ARMOUR'S 75th ANNIVERSARY

Marie Gifford

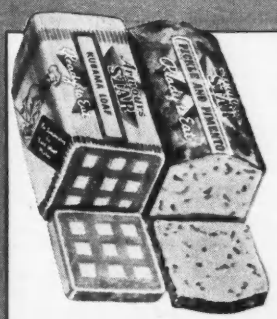
Director, Food Economics Department

ARMOUR AND COMPANY



Ready-to-serve Fresh Sausage

Best known of this type are Star Frankfurters, Star Liver Sausage, Star Bologna, Star Luncheon Meat. But there are many other tasty types. They are completely cooked, ready for the table. They owe their tangy flavor to a light, mild smoking after cooking.



Prepared Loaves

Dozens of baked meat loaves bear the Armour label. Among them are Veal Loaf, Kubama Loaf, Pickle and Pimiento Loaf. They're slowly baked in thermostatically controlled ovens ...then quickly French-fried to seal in goodness. All ready for the table.

Fancy Dry or Semi-Dry Sausage

Star Cervelat or summer sausage and Star Salami are the favorites of this group. They are highly seasoned chopped meat . . . smoked and air-dried. These, too, are ready to serve and keep especially well.

New York, and chairman of the Administration Section, American Dietetic Association. The material includes suggestions and means of presenting a nutrition study course and lists reference books and movies which will supplement the teaching as well as lists of current periodicals and books covering subjects under the following heads: "Food for Freedom"; "Three Groups of Foods—Why They Are Necessary for Family Proteins"; "Starches and Sugars"; "Fats"; "Minerals, Water, Bulk—Functions"; "Vitamins"; "Planning the Normal Diet"; "Deviations from the Normal Types"; "Suggested Study Course—Psychology"; and "Overweight and Underweight."

Feeding in a Disaster. Adeline Wood, who is on special duty at the Chicago office of the American Dietetic Association in connection with activities of dietitians in the defense program, and Ella M. Eck, dietitian at the Billings Memorial Hospital, Chicago, have prepared for the Chicago chapter of the American Red Cross a number of recipes modified to yield 100 uniform portions, with suggestions for equivalents in numbers, measures or weights for use in emergency. Miss Wood has also assembled suggested reference material for instructors in canteen work and has outlined three lessons of three hours each to be used in connection with A.R.C. 994, "Suggestions on Feeding in a Disaster," and has prepared mimeographed sheets concerning dishwashing in public eating establishments and the sanitization of dishes, some of which are based on the article by W. L. Mallman in the October 1940 issue of this JOURNAL. Pertinent data have also been assembled by Miss Wood on the types of canned goods which may still be packed in unlimited quantities and those which are classed as secondary products or items to be packed in limited quantities.

Canteen Refresher Course. The program for the refresher course given at Kansas State College April 16–18, according to Mrs. Bessie Brooks West, included the following:

American Red Cross Certification: Mrs. J. D. Colt, Chairman of Volunteer Service.
Canteen Service at Pearl Harbor: Mrs. Margaret L. Stewart, Graduate Assistant, Department of Institutional Management.
The Nutrition Program in Kansas and the Frozen Food Locker Plant: Mary Fletcher, Division of Extension.
The Frozen Food Locker Industry and the National Nutrition Program: Mildred Boggs, Pullman, Washington.
Methods of Teaching a Canteen Course: Ella Johnson, Department of Education, Kansas State College.
Responsibilities of Disaster Relief Chairman: V. E. Bates, American Red Cross, Manhattan.
Food Sanitation and Spoilage: Dr. F. E. Nelson, Department of Bacteriology, Kansas State College.
The Effect of War on Our Food Supply: Dr. W. E. Grimes, Department of Economics and Sociology, Kansas State College.
The Effect of Processing on the Nutritive Value of Food: Dr. Gladys Vail, Department of Food Economics and Nutrition.
Food and Nutrition Problems in a Disaster: Dr. Leah Ascham, Department of Food Economics and Nutrition.

Trips to various departments on the campus, and instruction in menu planning, recipe development, selection and care of equipment, and food control by the institutional staff of the college were also part of the course, as well as the actual preparation and service of food, canteen-style, to residents of the women's residence hall.

More About American Home Economics Association Convention. "The Family in a World at War" will be the central theme of the annual meeting which will be held at the Hotel Statler, Boston, June 21–24. Among the speakers will be Mrs. Dorothy Canfield Fisher, A. Drummond Jones, Paul Nystrom, Dr. George R. Minot; also Christina McKeever, director of restaurants, Wellington Hotel, New York; Marion Harlow, Department of Pensions and National Health, Ottawa, Canada; and M. Earl Heard, Philadelphia Textile School. Among the home economists scheduled to speak are Ruth O'Brien and Esther Batchelder, U. S. Bureau of Home Economics; Muriel W. Brown, U. S. Office of Education; Margery Vaughn, U. S. Office of Defense Health and Welfare Services; Mrs. Mabelle S. Ehlers, Michigan State College; and Helen C. Hamilton, General Foods Corporation.

"Consumer Centers," will be the subject of one round-table discussion, and attention will be given to new problems in feeding and clothing the family, dental health, nutritional deficiencies, new developments and trends in the foods field and in textiles, emergency mass feeding, child care, nutrition education, and college curricula.

Reports of Diet Therapy Section, A. D. A. The "Glossary of Dietetic Terms," prepared under the chairmanship of the late Sister Jeanne d'Arc, has been mimeographed and copies are now available from the American Dietetic Association, 185 North Wabash Avenue, Chicago, at 25 cents each. Another study reported under the chairmanship of Hilda Peters, "Food Groups in Relation to Therapy of Gastro-Intestinal Diseases," will also be mimeographed.

Dietitians in Registered Hospitals. The twenty-first annual presentation of hospital data by the Council on Medical Education and Hospitals of the American Medical Association, in the *Journal* of the American Medical Association for March 28, states that in the 6358 registered hospitals in the United States, with bed capacity of 1,324,381, 5548 full-time dietitians and 459 part-time dietitians are employed, a total of 6007, or an average of one dietitian to every 220 patients. Only 2307 of the total number of registered hospitals, with a bed capacity of 726,531, are approved by the American College of Surgeons. Figures for separate states showed that the number of patients per dietitian varied considerably. For instance, California averages one dietitian for every 259 patients; Illinois, one for every 243; and Massachusetts, one for every 222; while in North Carolina the ratio is one to 145; West Virginia, one to 174; New York, one to 196, and Virginia and South Carolina, one to 199. Pennsylvania is nearest to the average with one dietitian for every 219 patients.

Educational Qualifications of Nutritionists in Health Agencies. Reprints of an outline under the foregoing head were released on April 29 by the Committee on Professional Education of the American Public Health Association. The outline was prepared under the direction of Marjorie M. Heseltine, chairman of the subcommittee on the educational qualifications of public health nutritionists, and first appeared in the *American Journal of Public Health* for May 1941 and was approved in October 1941 by the Governing Council. Isabel B. Landy, associate secretary, Committee on Professional Education, writes that copies of the report will be sent to interested persons on application to her at 1790 Broadway, New York City.

American Institute of Nutrition. A symposium on "Human Requirements for the Vitamins" was presented before the American Institute of Nutrition at the Copley-Plaza Hotel, Boston, April 1, at which Drs. C. A. Elvehjem, George R. Cowgill, W. A. Perlzweig, and O. A. Bessey reported on recent findings in the nutrition field. Dr. Elvehjem reported that laboratory tests conducted at the University of Wisconsin indicated that the average adult requires about 10 mg. nicotinic acid (niacin) daily. Exact figures were: infants, 1 mg.; a child of 1, 2.2 mg.; child of 5, 4 mg.; child of 14, 5.4 mg.; adult female, 8 mg.; adult male, 11.2 mg., as against the original National Research Council's recommendation of 15 to 23 mg. for the adult male, etc. Dr. Elvehjem indicated that an average diet supplied about 11 mg. daily.

Busy Women of America are grateful for

INSTANT RALSTON

NEW PRE-COOKED HOT WHEAT CEREAL

No cooking needed . . . Saves time and fuel—Just pour into boiling water, stir and serve
So nourishing—made of WHOLE WHEAT with added wheat germ!
Such an easy way to include EXTRA natural VITAMIN B1 in the diet
INSTANT Ralston
HOT WHEAT CEREAL NEEDS NO COOKING
INSTANT RALSTON

TODAY two things are vital and precious: time and good nutrition. That's why Instant Ralston is recommended by doctors and nutrition experts. It's ready in a hurry. It's pre-cooked by a special process to retain vitamin values and minerals of nourishing whole wheat. It's extra rich in natural vitamin B_1—contains 2½ times as much wheat germ as whole wheat. Sample on request.

Now grocers everywhere have
Instant Ralston
and regular 5-minute Ralston

ALL THIS NUTRIMENT IN A PRE-COOKED CEREAL

61.2 I. U. Natural Vitamin B_1 per ounce

	PERCENTAGE		PERCENTAGE
Protein	15.00	Calcium	.05
Carbohydrates	70.00	Phosphorus	.40
Moisture	9.5	Iron	.0040
Fat	1.7	Copper	.0006
Fiber	1.8	Manganese	.0040
Ash	1.7		

Plus the nutrients in the milk or cream served with it

FREE! *Send for samples of New Instant Ralston*

RALSTON PURINA COMPANY,
903E Checkerboard Square, St. Louis, Missouri

Please send without cost or obligation, samples of New Instant Ralston.

*Name*_____ *Address*_____

*City*_____ *State*_____

(Offer limited to U. S.)

Dr. Perlzweig reported that in experiments at Duke University he found that when 500 mg. nicotinic acid was given to a woman the amount recovered in urine was insignificant and that the average daily loss by excretion was between 10 and 15 mg. He also indicated that there is a close interrelationship between riboflavin and nicotinic acid in the utilization of protein.

Dr. Bessey, reporting on studies on human requirements for vitamin C at Harvard University, explained that amounts as low as 40 to 70 mg. per day and as high as 125 to 140 mg. per day could be given, depending upon the method of depletion and the method of feeding. Results depended to a large extent on whether the analyses were made on blood plasma or on excreta and perspiration.

Nutrition Exhibit. A booklet bearing this title, prepared under the direction of Martha Alderman Hunscher, dietitian and director of the food clinic, The Pennsylvania Hospital, on the occasion of the nutrition exhibit at the Seventh Annual Postgraduate Institute of the Philadelphia County Medical Society, presents in convenient form the important information about maintaining good nutrition through the use of natural foods. For example, there is a dietary "pattern" to meet the recommended allowances, followed by a day's menu showing how these may be incorporated; then a chart showing recommended daily allowances for specific nutrients in terms of calories, vitamins, etc., with adequate footnotes explaining units used; also, a table showing the equivalents of food constituents in pounds or servings; and concluding with a vitamin C chart for Pennsylvania and New Jersey like that mentioned for Michigan elsewhere in this issue. The exhibit at which the booklet was distributed was built around a series of steps to the adequate diet, shown graphically against a background featuring a large "℞" with the question "Do You Order Special Diets?" On the steps below were such articles as scales, sieve, and clock, symbolizing modification as to quantity, consistency and frequency of foods in the adequate diet.

Saturday Evening Post to Assist in Nutrition Campaign. In an extensive advertising campaign for the sole purpose of presenting the need for proper nutrition and practical methods for applying nutrition principles, the editors of the *Saturday Evening Post* have been planning, with the assistance of Paul V. McNutt, Federal Security Administrator, what will probably be the most comprehensive and wide-spread effort of its kind. Each of the four June issues will carry two or three pages devoted to "lessons" entitled "Eat Milk and Eggs"; "Eat Fruits and Vegetables"; "Eat Meat, Fish and Poultry"; and "Eat Bread and Cereals." Great pains have been taken to express vitamin requirements, not in units, but in terms of food. Each page will present different ways of serving the featured foods and allied products and there will be an illustrated chart of daily food standards in each issue under the heading, "Every day, eat this way." Reprints will be issued to 3000 nutrition committee chairmen from the Office of Defense Health and Welfare Services, and the magazine will make reprints available to doctors, teachers, dietitians and nutrition workers. In addition, the *Post* is taking steps to contact every large chain and retailing organization with an offer of a vitamin display kit for each store, the kit to contain four posters, 13 by 16 inches, which are reproductions of the four-color illustrations of each "lesson"; menu suggestions for related item displays for counters, departments, and windows; price display cards in two colors with space for brand names and prices; and various sizes of newspaper mats. Trade papers carried appropriate advertising of the campaign, addressed to the retailer, in April and May.

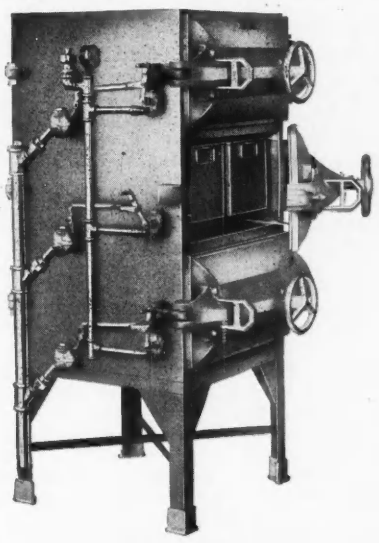
South Bend Nutrition Drive. One of the first large-scale "all out" nutrition drives took place in South Bend, Indiana, the week of April 13–18, sponsored by the nutrition division of the St. Joseph County Civilian Defense Committee and supported by federal government agencies. Stores and business firms gave prominent display space for posters. Actual displays of food were shown, to contrast rationed amounts in European countries with amounts available in the United States. One exhibit dramatized today's eampaign for better nutrition by illustrating wheatless, meatless and sugarless days of World War I. The drive had the support of wholesale and retail grocers and bread dealers, the local meat packing association, and councils of milk dealers and distributors of household electrical appliances. The South Bend *Tribune* featured display advertisements on enriched flour and bread in addition to special nutrition articles in its weekly foods news pages.

Office of Defense Health and Welfare Services. In a release March 25, Paul V. McNutt urged state and community health organizations toward better teamwork and cooperation. Quoting from his speech at the annual conference of the U. S. Public Health Service, he said that the part played by health agencies in the community facilities program had left much to be desired and that in some cases the Public Health Service had had to make decisions contrary to state health department policy and recommendations "in order to inject an element of reason into the facilities work." Some of the questions he asked health officers concerning their state of preparedness in the event of a bombing, were: "Has your state health department a clearly defined plan in the event of such a catastrophe? Who would man the first-aid stations? Who would organize the ambulance and hospital services? How would hospital bills be paid? [According to the April 18 *Journal* of the American Medical Association, the U. S. Government will pay for hospitalization of civilians injured by enemy action at the rate of $3.75 per day. Ed.] Is there a blood bank with sufficient plasma? Are there facilities for the emergency treatment of water?"

After a reminder that longer hou rs and increased working speed, the employment of women and the physically handicapped in industry, and increasing mental stresses and strains will add to the problems of health officers and agencies, and that nutrition may be impaired further if America has to become the granary as well as the arsenal of democracy, Mr. McNutt concluded significantly as follows: "I believe it is sound public administration to work through the fewest agencies possible. If, however, there is an urgent task to do and no old-line agency is willing or prepared to do it, the only alternative is to set up a new agency. Behind the recent multiplication of governmental agencies is a long history of official and neglected opportunity. I believe there are many lessons in this history which existing health agencies might well consider and in the light of which they might reconstruct their basic philosophies."

In a release dated April 2, a formula for industry cooperation with the National Nutrition Program was announced. This formula covers conditions governing the use of the official nutrition food rules in space advertising or printed material, and of the nutrition theme ("U. S. Needs US Strong—Eat Nutritional Food"). Government approval is required if the material is to be used in advertising in any manner other than that specified in the formula. An illustrated booklet, showing how the material may be used, accompanied this release. No plan for including radio in the advertising program has as yet been worked out by the Nutrition Division. All requests for approval of industrial advertising or sales promotional material tying up with the National Nutrition Program should be sent to the Office of Defense Health and Welfare Services, Washington, D. C.

A Nutrition News Letter, signed by Helen S. Mitchell



Include

STEAM-CHEF

Steam Cookers

In Your Future

Kitchen Equipment Budget

Right now equipment purchases must be deferred in order to advance the Victory program. But after the war your need for kitchen efficiency will be greater than ever and a Steam-Chef will be the answer to many of your problems. Here is what one of these steamers will give you:

- Food which keeps its flavor, color and texture, and also high nutritive values—because vital soluble salts and vitamins are better retained by the steaming method.
- Automatic controls which give utmost economy of fuel.
- Equipment which is easy to operate and keep clean with ordinary help.
- All latest approved features of construction, which save time, space and work.
- In short—steaming at its best—because Steam-Chef is built by specialists in hospital needs.

Steam-Chef Users: Write us or ask your dealer for new Steam-Chef Service Guide, containing important maintenance information. Booklet "Getting the Most from Steam Cooking" also sent on request.

THE CLEVELAND RANGE COMPANY

3333 Lakeside Ave. Cleveland, Ohio

Cleveland STEAM-CHEF for better cooking--STEAM

The chemical composition of Karo in glass and in tins is identical

Liver Disorders

•

IMPAIRED liver function requires a readily assimilable diet, high in carbohydrate and low in protein and fat. KARO is ideal because it is easily digestible, non-fermentable and well utilized.

•

Free to Physicians

"Infant Feeding Manual For Physicians" is a concise, helpful monograph containing specific information and tested Karo feeding formulas. Sent postpaid.

•

Please Write Medical Department

CORN PRODUCTS REFINING CO.

17 Battery Place, New York, N. Y.

and dated March 31, to all state nutrition committee members, gives an overall picture of the Nutrition Information Plan, including suggestions for reaching producers and consumers through government and non-government channels; food "points of sale"; also activities of state, county and local committees. Copies of basic material for general distribution, and an outline of its purpose and possible use locally, accompany the letter. The need for cooperation of the food industries and of national, civic, labor, and women's organizations in spreading nutrition information is stressed.

Special Packages for Army's Dehydrated Foods. According to a recent announcement from the Quartermaster Corps, U. S. Army, "paper cartons treated with various chemicals and wax coatings which are virtually moisture-proof and are not subject to deterioration under temperature extremes" have been developed for packaging dehydrated foods for Army use. "Some dehydrated products, the test program reveals, readily give off their flavor if exposed to the air. Onions, for this reason, must be kept in an air-tight package. Other products, like cabbage, will deteriorate through oxidation and therefore must be packaged in an oxygen-free atmosphere. In such case the oxygen in the hermetically sealed package is displaced by either nitrogen or carbon dioxide. Certain concentrated products deteriorate in direct proportion to their storage temperature. Onions, for instance, can be kept in good condition for as long as two years if placed in a storage temperature of 40°F. On the other hand, onions packaged in exactly the same way will hold very little flavor at the end of only 60 days if stored at 100°F."

National Restaurant Association held a meeting in Chicago April 16 for the purpose of discussing methods whereby the restaurant industry can more advantageously assist in promoting the national nutrition program. Among those attending were H. E. Houghton, merchandising consultant to Paul V. McNutt; members of the *American Restaurant Magazine* staff; F. O. Washam, director of the Chicago School Lunchrooms; Mary Kavanaugh, food director, Chicago School Board; and Alberta M. Macfarlane, educational director, National Restaurant Association. Mr. Houghton pointed out that many industrial organizations interested in making a contribution to the national nutrition victory program were tying in with the advertising and merchandising campaign both the nutritional yardstick and the new emblem and slogan. He told how Schrafft's Restaurants in New York had been using the emblem in their newspaper advertising. Here an appeal is made to the public to choose the right food because good citizenship and good sense say: "U. S. Needs US Strong," and the nutritional yardstick is featured with the heading: "Eat This Way Every Day." On the back of the menus the requirements for a day are listed, and attractive red, white, and blue folders bearing the nutrition emblem on the cover and the yardstick inside are placed on each table. Those present at the meeting discussed, among other things, ways and means of making such material available for restaurants, since the Office of Defense Health and Welfare Services does not furnish it free for distribution to patrons. Many restaurants are now using the giant size poster on nutrition of the American Meat Institute, which depicts in full colors the foods listed in the government's "Guide to Good Nutrition."

Dr. Frank G. Boudreau, director of the Milbank Memorial Fund, is now chairman of the Food and Nutrition Board (formerly called the Food and Nutrition Committee of the National Research Council). H. C. Sherman, Ph.D., Columbia University, is vice-chairman and Frank L. Gunderson, Ph.D., executive secretary.

Nutrition Foundation, Incorporated. This foundation, the formation of which has been announced in previous issues of the JOURNAL, has begun its public career with headquarters in the Chrysler Building, New York. Dr. Karl T. Compton is chairman of the board, and the scientific advisory committee includes: Drs. H. C. Sherman, E. V. McCollum, C. A. Elvehjem, L. A. Maynard, F. F. Tisdale, W. H. Sebrell, W. C. Rose, R. C. Newton, Lydia J. Roberts, J. R. Murlin, Icie Macy Hoobler, R. R. Williams, F. G. Boudreau and Col. Paul E. Howe.

In the April issue of *National Nutrition*, Paul S. Willis, president of the Associated Grocery Manufacturers of America, stated that questionnaires sent out by his organization reveal that many of the leaders in the food field intend to make the nutrition theme the basis of their advertising and promotional messages for the balance of the year. In the same issue Mr. Willis mentioned that food processors are proceeding on the assumption that present heavy demands on their facilities will soon be overshadowed by even heavier pressure, and are laying their production plans accordingly. The nation's allies are becoming progressively more dependent on shipments of American foodstuffs, he pointed out, and as the size of our armed forces increases, their food orders grow proportionately. In addition, with the National Nutrition Program calling attention to the need for a balanced diet to strengthen "the home front," per capita consumption of food by the American public is expected to rise. Where shortages of foods such as certain spices, condiments, fats, oils, and beverages exist, Mr. Willis stated that the American food industry will seek, through its 600 research laboratories, to find non-critical substitutes of equivalent or higher quality.

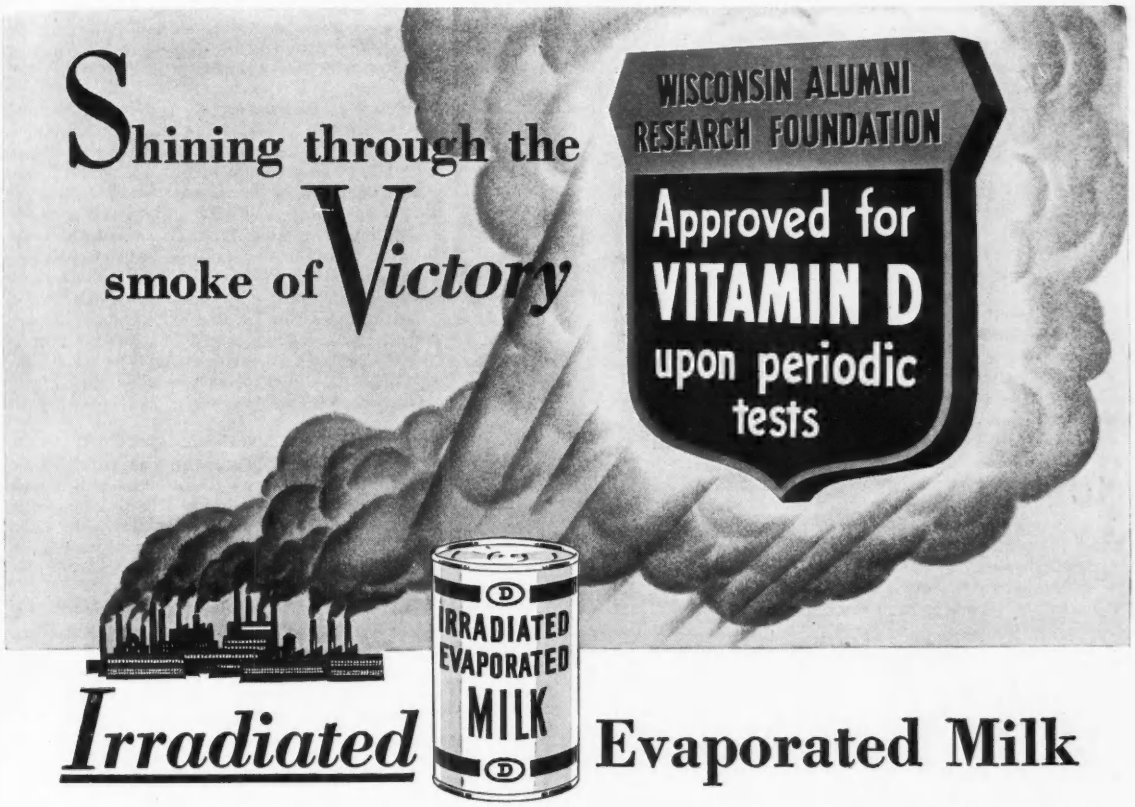
American Red Cross Dietitians and Nutritionists. According to information dated April 9, 255 dietitians have enrolled with the Red Cross, 54 of whom are serving in the Medical Corps of the U. S. Army. Approximately 15,000 qualified teachers are conducting nutrition and canteen courses, and about 100,000 persons are enrolled in nutrition and canteen classes. More than 36 openings for full-time Red Cross nutritionists are being filled.

Dietitians in Industry. The need for dietitians in food service departments of industrial plants was emphasized by Dr. Robert S. Goodhart on the "Listen America" program broadcast Sunday, April 12. Dr. Goodhart insisted that a trained dietitian was an absolute necessity in all such organizations and urged their immediate inclusion in every food service program. When questioned as to whether he had seen many dietitians in industrial food services, he said that he had seen only two—in camps.

Nelda Ross Speaks Before New England Hospital Group. Food and nutritional problems were the subject of a symposium before a hospital assembly in Boston in March, at which Miss Ross, President of the American Dietetic Association, was the principal speaker. Dr. Elda A. Robb, professor of nutrition, Simmons College, spoke on vitamins. The purpose of the assembly, as stated in *Hospital Topics*, was to review plans for war emergencies, including air attack and sabotage.

Army Dietitian Leaves for Foreign Service. Lois Hamilton, head dietitian, Station Hospital, Fort Lewis, Washington, and formerly of Walter Reed Hospital, Washington, D. C., left in March for foreign service. Leah Teale, Oklahoma A. and M. College, and Pennsylvania Hospital, Philadelphia, has replaced Miss Hamilton. Fort Lewis Station Hospital has a bed capacity of 1850 and the Mess Department has a staff of 14 dietitians.

The Soldier and His Food. The foregoing is the title of one of a series of pamphlets prepared by the Women's In-



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For now, from America's war industries, there rise great clouds of smoke, dust, and soot that largely intercept and nullify the always uncertain and undependable Vitamin D effect of sunlight. Moreover, U. S. Weather Bureau data for 67 widely separated cities show that, on the average, two days out of three are cloudy.

Turning to usual milks and foods avails little in so far as supplying the essential calcium-mobilizing Vitamin D. The one essential food factor which is consistently lacking or inadequately supplied is Vitamin D.

Supplies Vitamin D Automatically

Infants and growing children of today can be given a large measure of protection against results of Vitamin D deficiencies when Irradiated Evaporated Milk is used in the home. *Automatically,* this product provides Vitamin D together with calcium, phosphorus, and milk's usual nourishment for which growing bodies have a special need.

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Let us mail you "Rachitic Studies" by May and Wygant, which reports three years of clinical research on 616 children. With it, we will send you charts on Vitamins and Nutrition, and Sunshine Data on 67 cities. Mail the coupon below, your letterhead, or prescription form, today.

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terests Section, Bureau of Public Relations, War Department, and dedicated to the women of the United States. Titles of the other pamphlets are: "The Soldier and His Housekeeping"; "The Soldier and His Religion"; "The Soldier and His Uniform"; "Fit to Fight . . . and Fit for Life"; "The Soldier and His Health"; and "The Soldier and His Recreation."

Sugar Conservation. Cards captioned "Please Help Us Conserve Sugar," which may be placed on dining tables, are available in quantities of 50 for $3.00, 100 for $5.00, and in larger quantities for correspondingly less per card, on application to *Institutions*, 1900 Prairie Avenue, Chicago.

More About Sugar Rationing. In addition to the information which appeared in a filler in the May JOURNAL, a release from the Office of Price Administration, dated April 27, states that among the establishments classified as institutional users are hotels, restaurants, resorts, fraternities, sororities, dormitories, hospitals, boarding houses, orphanages, convents, monasteries and state institutions such as prisons and asylums. It also states that consumers who eat 12 or more meals a week in an establishment registered as an institutional user are required to surrender their War Ration Books to the owner or manager of the establishment in order to permit removal of the sugar ration stamps for cancellation by the local rationing board. The books will be returned to any consumer who ceases to eat 12 or more meals a week at the establishment.

Prices Fixed on China and Pottery. Maximum Price Regulation No. 116 fixes maximum prices for the sale by manufacturers of vitreous and semi-vitreous ware in the United States or for export. Rise in pottery prices has been attributed to wage increases, decline of imports from Japan, Germany, Czechoslovakia, France, and the United Kingdom, the curtailment of materials such as lead, nickel, zinc, chromium, and copper, and the growing demand for pottery. For the purposes of the order, "china and pottery" designate any undecorated, decorated, vitreous, or semi-vitreous china or earthenware, commonly used for cooking, mixing, storing, or service of food or beverages, with the exception of products customarily sold in the past by the manufacturer as "stoneware," novelty and decorative items known as "art pottery," and rejects.

Corn Industries Research Foundation Appoints Nutritionist. Gertrude S. Smith, formerly health education director for the Twin City Unit, National Dairy Council, Minneapolis, has been appointed chief nutritionist of the corn refining industry. She will direct the industry's plan for translating the government's nutrition program into community projects in the twelve cities in which corn refining plants are located and will coordinate her teaching of "good food habits" with local and state plans.

Dietitians and Occupational Therapists Meet. The value of close correlation between the food and occupational therapeutic services in mental institutions was discussed at a luncheon meeting at the Men's Faculty Club, Columbia University, New York, April 25. Mrs. Albert Lythgoe, assistant director, Boston School of Occupational Therapy, was the speaker and conducted the discussion.

New York State Regulation on Nurses' Registries. A new bill has been introduced in the New York State legislature to provide for the regulation of nurses' registries throughout the state, according to the *Journal* of the American Medical Association, April 11. The bill states that "the term nurses' registry means the business of conducting a registry, office or other place for the purpose of counseling, offering, procuring, promising or attempting to procure employment or engagements of any kind, for registered professional nurses, or for licensed practical nurses, or for dietitians, anesthetists, medical secretaries or medical technicians and for which a fee is exacted or charged."

Joint Conference of Dietitians. A conference of dietitians, sponsored by the Illinois, Indiana and Wisconsin Dietetic Associations, was held at the Stevens Hotel, Chicago, May 6–7. The program included a panel discussion, "Pertinent Problems of the Hospital Staff in Relation to the Dietary Department," in which Drs. Arthur Bachmeyer, University Clinics, and W. H. Hibbs, Presbyterian Hospital, and Ada B. Lothe, supervising dietitian, Milwaukee County Institutions, participated; as well as a talk by Mary I. Barber, "Carrying the Yardstick of Nutrition to the Home," with discussion by Mary Freeman, Chicago Normal College, Hedwig Poehler, Health Department of Milwaukee, and Ruth Hueneman, Zoller Dental Clinic. Miss Barber was also the speaker at a luncheon meeting at which Dr. Cecelia Schuck, president, Indiana Dietetic Association, presided.

Exploring Opportunities for Women in Commercial Aviation. As a part of the vocational guidance program at Stephens College, Columbia, Missouri, a finding course in occupations within the aviation industry has been added to the curriculum. Four commercial aviation companies are participating in the course in order that air-minded women may have an opportunity to explore the field of commercial aviation and decide where they can best serve. All lecturers—major executives, pilots, personnel managers, office managers, engineers, executive secretaries, and hostesses—have stressed the limitations as well as the opportunities for women in aviation, each one pointing out specifically those in his particular branch of service. Lectures have been supplemented by trips to airports and factories manufacturing aviation equipment and by air trips.

Group Health Plans. Edward A. Filene Good Will Fund, Inc., 31 Milk Street, Boston, now has available four pamphlets on group medical practice, ready for immediate mailing to those requesting them.

Sister Jeanne d'Arc Hurley, director of the Home Economics Department of Fontbonne College, died April 10, in Saint Mary's Hospital, St. Louis, following an illness of six months. She was well known to many members of the American Dietetic Association, having been an active member and a contributor to the JOURNAL. She held a master's degree from the University of Chicago and received a doctorate from the same institution in 1933, and had been director of the Home Economics Department of Fontbonne College since 1937. During the summer of 1941 she gave a nutrition course in St. Louis to over sixty women. Aside from contributions to this JOURNAL and the *Journal of Nutrition*, Sister Jeanne d'Arc was the author of a dissertation entitled, "Digestibility and Nutritive Value of Raw and Cooked Vegetables and Protein Foods," and a "Dietetic Laboratory Manual."

Alida Frances Pattee, member of the American Dietetic Association, author and lecturer, and a pioneer in the profession of dietetics, died at Bronxville, New York, on April 3. Miss Pattee was born in 1867 at Milwaukee and as a young woman taught music and painting. When her family moved to Framingham, Massachusetts, she attended the State Normal School and after doing research work in this country and Europe, became established as an authority on dietetics. She taught student nurses at Bellevue, Mount Sinai and Flower Hospitals in New York, and at other hospitals in Chicago, Milwaukee and Ontario.

Pattee's Dietetics, issued first in typewritten form, was published as a book in 1903 and had reached twenty-two

The Newer Concepts of Meat in Nutrition

Meat . . .
in the Management of Enteric Disease

IN THE dietary management of many intestinal disturbances such as colitis, the dysenteries, and acute catarrhal enteritis a low-fiber, low-residue diet is indicated. Hence many foods ordinarily depended on for vitamins and minerals must be eliminated because of their content of indigestible cellulose which proves irritating to the hypersensitive intestinal tract. Easily digestible, low-fiber foods must carry the burden of satisfying nutritional requirements. Furthermore, since the need for thiamine and other B complex vitamins is increased in these conditions, the dietary must be especially rich in these vitamins.

According to Donald and Brown,* protein derived chiefly from red meats, liver, kidney, sweetbreads, and lean pork is the most important food for the patient afflicted with ulcerative disease of the colon. They concluded from their investigation that the prognosis is greatly improved by a high protein diet.

Because meat and meat specialties (kidney, liver, and sweetbreads) contain little or no irritating fiber, and are almost totally digestible, they are pre-eminent in low-residue diets as food sources of biologically adequate proteins, the essential B vitamins and the minerals iron, copper, and phosphorus.

*Donald, C. J., Jr., and Brown, P. W.: Ulcerative Colitis, Am. J. Digest. Dis. 7:234 (June) 1940.

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editions by 1939. It has been widely accepted as a standard textbook in training schools. Her latest book, *Vitamins and Minerals for Everyone*, was reviewed in the April issue of this JOURNAL.

District of Columbia Dietetic Association. A dinner meeting was held at the Dodge Hotel, April 18, with Mary Pascoe Huddleson as guest of honor and speaker. Mrs. Huddleson's experience and participation in the first World War added zest to her discussion of the dietitian's place in wartime.

The association is proud to report that the contributions to the Bond Bank, the silent member at each meeting since September 1941, have yielded the necessary total for the purchase of a $25 war bond.

Mary Warmuth, Providence Hospital, is acting as the association's representative on the District's Nutrition Program Committee. Many of the members have been conducting nutrition and canteen courses during the year, and Mrs. Lennice Sartell, St. Elizabeth's Hospital, has been appointed supervisor of all teachers of canteen courses given in the District, under the program of the American Red Cross.

Maryland Dietetic Association met February 2 at Johns Hopkins Hospital. Dr. John Eager Howard, associate in medicine, spoke on "Obesity." At the March meeting, also at Johns Hopkins Hospital, Dr. E. V. McCollum, School of Hygiene and Public Health, spoke on "Dental Caries."

Case studies on nephritis and nephrosis were presented at the Diet Therapy Section meeting March 16 by student dietitians at Johns Hopkins Hospital. At the Administration Section meeting at Women's Hospital, March 23, wartime recipes, rationing and current labor problems were discussed.

Gladys McMurchy Mason has left Johns Hopkins Hospital to be with her husband, Dr. James M. Mason, who is stationed at Fort Bragg. Lucille Cover, formerly at Post-Graduate Medical School and Hospital, New York, is now at Johns Hopkins Hospital. Helen Moxley and Mary Stansel are doing graduate work at Columbia and Western Reserve Universities, respectively.

Announcement has been received of the marriage of Jean Daubert to Dr. Leonard J. Abramovitz, February 22, and of the engagement of Elizabeth Anne Jenkins to George W. Corner, Jr., and Betty McDaniels to George Hansen.

Michigan Dietetic Association. The spring meeting of the association was held in Ann Arbor, April 17–18, with the following program: "Nutrition in Time of War," Dr. Thelma Porter, Michigan State College; Panel Discussion—"Sweeping Clean," Mrs. Mary R. Waller, University Hospital, and Mary Barnes, West Quadrangle, Ann Arbor; "Preoperative and Postoperative Care," Dr. Henry K. Ransom, University Hospital; "Movies, An Aid in Teaching Nutrition," Adelia Beeuwkes, University of Michigan; "Canteen Service," Mrs. Glenn McGeoch, co-chairman, Canteen Committee for Washtenew County; Panel Discussion—"Wartime Adjustments in Institution Food Service," directed by Mary McKelvey, University Hospital; "Management of Juvenile Diabetics," Dr. Frederick W. Palmer, University Hospital; and "Up-to-date Nutrition Review," Ann Light, research dietitian, University Hospital.

The spring *Bulletin* of the association offers a "Vitamin C Calendar," listing seasonable sources of this vitamin which are available during the months from May to November. In May, for instance, rhubarb, green onions, radishes and dandelion greens are plentiful, and an average serving of each, it is said, will provide a total of 97 mg., the maximum daily requirement. Strawberries in June and July, tomatoes in August, sweet corn and cantaloupe in September, and apples, potatoes and cabbage in October and November, follow each season's yield.

Dr. Lillian B. Storms makes a plea that dietitians serve as consultants to organizations who wish to plan and execute a nutrition program. Organizations such as American Association of University Women, P.T.A., Service Clubs, and industrial and factory groups are asking for help in presenting nutrition to their members.

Another short article in the *Bulletin*, on dried soy beans, comments on the high vitamin content of these compared with other dried beans. The vitamin A content of a 100 gm. portion is 100 I.U. and the thiamin content, 400 I.U., or more than double that in other dried beans. Although the iron content is less, the calcium and phosphorus content is higher. It is sometimes difficult to ensure sufficient protein for an allergic patient. If soy beans can be added to the diet of such patients the problem is solved. Soy bean oil, a by-product, may be used for pan frying, deep-fat frying and as a substitute for salad oil. Edible varieties of soy beans include the Bansei, Hokkaido, Imperial, Giant Green, Easycook, Willomi, Emperor, Jogun, Fuji, Rokusun, Yellow Marvel, Kanum, and Sansei. The U. S. Department of Agriculture Bulletin No. 549 gives the following percentage composition for the soy bean: protein, 34.9, fat 18.1, and carbohydrate 12.0.

Several low-sugar menus to conform with federal regulations are suggested in the *Bulletin*, with baked custard, crême brulée and Indian pudding included as desserts.

Julia Grant, supervisor of home economics, Detroit Public Schools, is conducting a refresher course in foods and nutrition. Three hundred and ten home economics graduates have enrolled and upon completion of the course will assist in community group teaching. Considerable progress has already been made in this direction; from July through December 1941, 300 talks were given with an attendance of 11,500.

The Red Cross nutrition classes in Ann Arbor are exceedingly popular and the residents are continually requesting further courses. Seven classes in nutrition have been completed and one in the canteen course. Five nutrition classes and three for canteen aides were in progress during March. These were given in Ypsilanti, Milan, Dexter, Chelsea, Saline, Manchester and Dixborough.

Missouri Dietetic Association. According to *Missouri Mutterings*, bulletin of the association, a work-shop on instruction of Red Cross nutrition classes, held recently in St. Louis, discussed problems related to keeping the teacher well informed, flexibility of the outline to suit various groups, and teaching methods. Among the suggestions offered as possible means by which an instructor might keep herself up to date on nutrition was the provision of a room in which suitable reference material might be kept on hand and made available to the teacher, such material to include books, periodicals, reprints, bibliographies, and illustrative material on food and nutrition. It was suggested that a member of the staff in the public libraries might volunteer to watch for and collect articles which might be of interest to instructors and students, and to keep on hand suitable reference material. It was agreed that there was a need for similarity of text material, and at the same time sufficient flexibility to meet the needs of a particular group. As to teaching methods, those who had taught three classes a week agreed that it would be advisable to have not more than two, and the group decided that a combination of lecture and practical demonstrations of food preparation is more desirable than either alone if time and type of demonstration are well planned. In the work-shop on Red Cross canteen courses, qualifications for the instructor were discussed and the following agreed upon: B.S. or B.A. degree in home economics, with a major in dietetics or institutional management; at least one year's experience (within the past four years) in hospital dietetics, management of school or other cafeteria, restaurant, camp,

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Vegex-Tomato Juice Cocktail

Dissolve from one-half to a level teaspoonful of Vegex in a little warm water and add to a glass of chilled tomato juice.

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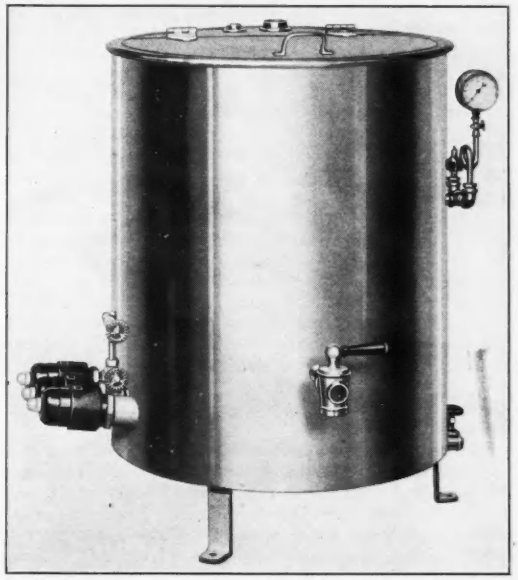

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or similar food service, or management of food service in a public or private institution. There was a general feeling that the twenty class-hours required for the course were not sufficient to train women actually to assume the set-up and management of canteens to be used for feeding groups of people in an emergency, and the following suggestions were given: Permit members of the canteen corps, who have completed their course, to get added experience in planning, preparing, and serving banquets for the Scouts or similar organizations, relieving the regular help in some large institutional kitchen by planning, preparing, and serving an evening or noon meal, or spending some time in different types of kitchens such as school lunchrooms, commercial cafeterias, restaurants, and social clubs. Dietitians present at the work-shop who are connected with institutions having kitchens available for laboratory use offered these facilities to qualified instructors for class purposes. The group of prospective instructors present felt that they needed to have a better understanding of just what procedure the Red Cross wished carried out in St. Louis.

The St. Louis Dietetic Association is again testing quantity recipes for the Pet Milk Company, the funds derived from which will be used to buy equipment for a stationary kitchen for teaching canteen cookery to Red Cross classes, to be housed in one of the Washington University Medical School buildings.

Mary Reeves, who joined the staff of the Missouri State Board of Health recently, is visiting the county health units throughout the state, observing conditions first hand in the clinics, schools, and individual families, for the purpose of assisting in the formulation of plans to inaugurate improved nutrition conditions in the defense plants.

Lucy Simpson, a graduate of the University of Minnesota, who trained at the University Hospital in Minneapolis, has been appointed assistant to Frances MacKinnon in the midwest branch of the American Red Cross.

The following engagements have been announced: Mary Catherine St. John, Firmin Desloge Hospital, to Dr. Joseph M. Krebs; and Dorothy Duckles, nutrition consultant for the Community Health Association, Boston, to Mr. Edward Hudson, director of the Dennison House Neighborhood Center, also of Boston.

New Jersey Dietetic Association. On April 2 a meeting of the Administration Section, with Sophia Morris, chairman, presiding, was held at Beth Israel Hospital, Newark. The committee is working on an outline for nutrition courses.

A joint supper meeting of the state dietetic and home economics associations was held April 15 at the L. Bamberger and Company department store. Dr. Clara Taylor, assistant professor of nutrition, Teachers College, Columbia University, spoke on "Visual Teaching of Food Values."

The executive committee met April 22 to discuss plans for the joint meeting with the New Jersey Hospital Association in Atlantic City. It was decided to omit the usual spring meeting, owing to the current shortage of gasoline and tires. It is hoped that it will be possible to hold the annual fall meeting.

Announcement has been received of the marriage of Jean Berman, formerly a student in the New Jersey Cooperative Student Training Course, to Corporal Martin Levin.

Dr. and Mrs. David Glick (Annette Zelzer) are now residing in New York City where Dr. Glick is doing research work for the government at Mt. Sinai Hospital.

New York State Dietetic Association. Genevieve Craver and her staff entertained the Rochester Dietetic Association at the Genesee Hospital, March 16. Dr. Nathaniel Jones, University of Rochester, spoke on "Fever Therapy in the Treatment of Certain Diseases." The association met at Highland Hospital, April 20, at which time Dr. W. A. Sawyer, medical director, Eastman Kodak Company, discussed "The Working Man's Diet as Related to His Efficiency."

The 13th annual meeting was held at the Hotel Utica, Utica, May 7–8. About 130 members registered and great interest in both exhibits and lectures was apparent. An excellent and timely program was arranged by Jessie Cole, including the following: "Preparation for Leadership," Flora M. Thurston, Cornell University; "New York State's Food Supply in Terms of Essential Nutrients," Dr. Sydney A. Asdell, Cornell University; "Can New York State Fish Resources Supply More Food?" Dr. John R. Greeley, New York State Conservation Department; "England's Lessons from the War," E. M. H. Lloyd, economic adviser to the British Ministry of Food; "Changing Concepts in the Therapy for Diabetes Mellitus," Dr. Herbert Pollack, Mt. Sinai Hospital, New York; "Newer Aspects of Nutrition," Dr. Caroline Sherman Lanford; "Maintaining Sanitation in Serving Food under Emergency Conditions," Walter D. Tiedeman; "How Civilian Mobilization is Counting on Nutritionists," Mrs. Winthrop Pennock, State War Council; "How One City Tackled the Nutrition Problem," Dr. Estelle E. Hawley.

Hostesses presiding at the various meetings included the following: Mame T. Porter, New York State Department of Social Welfare; Frances Crossman Dill, Utica Dietetic Association; Marie Krause, New York Hospital; Ethel Lewis Marth, president, New York State Dietetic Association; Rachel Mayhew, Roosevelt Hospital, New York; Marcia Rosbrook, president-elect of the state association; and Elizabeth Henry, Rochester Visiting Nurse Association.

At every session, those present were made acutely aware of their place and responsibility in the present crisis, and each member was convinced of the necessity of "Team Work for Victory," the theme of the convention.

The meeting also had its gala side. The Utica association, under the leadership of Mrs. Chester Dill, chairman of local arrangements, excelled in hospitality and entertainment. The banquet was a spectacular affair, especially so when the ballroom doors first opened to view a long "V" of tables the length of the room, lighted with red, white and blue candles.

Under the leadership of Marguerite Klobe, state chairman of exhibits, each local association contributed generously to the educational material displayed for the benefit of members and as a public service in the community.

Officers elected for 1942–43 are: president, Marcia Rosbrook, Syracuse Memorial Hospital; president-elect, Jessie G. Cole, State Health Department; vice-president, Louise Stephenson, Presbyterian Hospital, New York; secretary, Etta Handy, School Department, Rochester; and treasurer, Meredith Jones, Syracuse Memorial Hospital. Eleanora Sense will continue as editor of the *Bulletin*.

North Carolina Dietetic Association has elected the following officers: president, Tiphaine Burgess, Watts Hospital, Durham; president-elect, Mabel Swanson, Woman's College of the University of North Carolina; vice-president, Evelyn Gibson, Charlotte Memorial Hospital; secretary, Mrs. Isabel M. Fletcher, Raleigh; treasurer, Cleone Boyd, Greensboro.

Philadelphia Dietetic Association. Lillian Hack, dietitian, St. Christopher's Hospital for Children, writes that an Administration Section and a Professional Education Section have been set up. Also, it is significant to note that the name of the Special Diets Committee has been changed to Community Nutrition, and that the former committee is to be a subcommittee of the latter. The association hopes that through the Community Nutrition Committee, the membership will become better acquainted

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with the objectives and policies of the national nutrition program and the work of state and local nutrition councils.

Miss Hack reports that an experimental "panel meeting" was conducted for the general public by the Y.W.C.A. and planned by the Kensington Community Council. A flier announcing the meeting was titled "Good Health is Good Defense" with the catch phrase, "Come learn how and where Kensington children and parents get health care." Among the topics discussed under the direction of authorities were: Preventive Medicine Today, Dental Care and General Health, What the Schools Offer Toward Health Care, Bridging the Gap Between Home and School, and How Parents Can Co-operate with the Nutrition Program. Those who attended were invited to bring questions and to join in the discussion.

South Carolina Dietetic Association held its fifth annual meeting May 8 at the Wade Hampton Hotel. Among the speakers were Mr. G. A. Buchannan, chairman of the Columbia Defense Council, who discussed "The Place of the Professionally Trained Woman in the Defense Program," and Dr. E. J. Lease, biochemist, South Carolina Experiment Station, who presented "Keeping Ahead in This Rapidly Growing Field of Nutrition."

Recent appointments include that of Marguerite Whetsel, formerly dietitian at Tuomey Hospital, Sumter, now head dietitian at Shaw Field Station Hospital; and Sue Clark, formerly of Tri-County Hospital, Orangeburg, and the Municipal Hospital, Tampa, Florida, who has returned to South Carolina as dietitian at the First Service Club, Fort Jackson.

Texas Dietetic Association. With the April 1942 issue of the *Bulletin*, one of the oldest and best edited of all state dietetic publications was discontinued for the duration.

At the recent annual meeting, program for which appeared in the May JOURNAL, Rosa Spearman, supervisor of school lunchrooms in Dallas, was elected president, and Jonnie McCrery, professor of foods and nutrition, Texas Technological College, vice-president.

The Dallas Dietetic Association met March 3 at Southern Methodist University. Dr. Florence I. Scoular, director of home economics at North Texas State Teachers College, was the speaker.

The Lubbock Dietetic Association held its final meeting of the year April 30, at which Dr. Marietta Eichelberger, director of nutrition work, Evaporated Milk Association of Chicago, was the principal speaker.

Recent marriage announcements include: Bess Carr, Harris Memorial Hospital, Fort Worth, to Mr. Clay Foulson, Dallas; and Lovilah Sheker, Baylor University Hospital, to Mr. Lyman C. Lutes, Will Rogers Field, Oklahoma City.

Virginia Dietetic Association met with the Carolinas-Virginias Hospital Conference, and with the West Virginia Dietetic Association as guests, at the Hotel John Marshall, Richmond, April 16–18. Dietitians who spoke at a joint session on April 17 were: Margaret Joseph, St. Joseph's Hospital, Parkersburg, West Virginia, whose subject was "Dietitians—Their Contributions to Civilian Health," and Mrs. Mary P. Huddleson, "The American Dietetic Association Faces a Second World War," with Dr. Hu C. Myers, president, Hospital Association of West Virginia, presiding. The program of the state dietetic association, which was devoted largely to defense, was arranged by Mrs. Helen R. Robertson, Johnston-Willis Hospital, Richmond, and chairman of the Diet Therapy Section for the Virginia Dietetic Association.

Presiding officers who appeared before the sectional meetings included: Erna Mae Behrend, Tidewater Section; Mrs. Mildred Murdock, Southwest Virginia; Doris Woodward, Blue Ridge; and Bertha Ide, president, Virginia Dietetic Association. Other speakers at the sectional meetings of the dietetic associations were: Clara G. Turner, Administration Section; Mrs. Sally Ann Kurka, Community Education Section; Elizabeth Burrus, Professional Education Section; and Mrs. Robertson, Diet Therapy Section. Reports of nutrition defense work were presented as follows: Margaret Fitzhugh, Richmond Area; Erna Mae Behrend, Tidewater Area; Mrs. Bernice R. Varner, Blue Ridge Area; and Ella Sue Carr, Southwest Virginia Area. A summary of these reports appears under the Current Comment section of this JOURNAL.

An interesting feature of the luncheon on Thursday was the presentation to each guest of defense savings stamp books, with the first stamp in place, the gift of the Richmond Dietetic Association and accompanied by verses entitled "Patriotism and the Dietitian."

John Sexton & Co., opened in May a distributing plant, newly constructed, at 697–739 West Whitehall Street, S.W., Atlanta, Georgia, incorporating all the facilities necessary to render a complete service to the hotels, restaurants, hospitals, schools, clubs, and camps in the southeast. According to Sherman J. Sexton, president of the company, the extension of its service into the Atlanta market will enable the company to give the same fast economical service in that area that it is currently offering to the leading hotels, restaurants, and institutions in New York and Chicago.

Under a grant from **Swift & Company,** Chicago, the study of the effect of liver damage produced by low protein diets is to be continued at the University of California, under the direction of Dr. Agnes Fay Morgan, chairman of the Division of Home Economics. Dr. Morgan has reported that continued use of diets containing little protein may result in such extensive damage to the liver that the body is unable to make use of the potential vitamin A supply contained in fruits and vegetables. These conclusions are based on preliminary results of laboratory work performed with animals. "Since most of our vitamin A is obtained from the diet in the form of carotene, the method of carotene's transformation into the vitamin becomes an important factor in human nutrition. If low protein diets are shown to hamper manufacture of vitamin A in the body, meat may assume greater significance as a source of good protein," stated Dr. Morgan.

The Detroit Meeting

Of course you're planning to be in Detroit for the annual convention. This year more than ever you'll want to join your fellow members in attending the many meetings planned for your benefit.

Being at war is serious business and this convention, the first the Association has ever held during wartime, is keyed appropriately. Knowing you will be busy at your various important jobs, many of the fancy trimmings have been deleted. You'll come to Detroit to learn what others are doing, to talk over problems of your own. The convention program has been condensed into three important days, days filled with talks, workshops, discussion groups and committee meetings. "Simplicity and Thrift" will be the theme, and the convention will be more in the nature of a three-day working institute designed to fit the dietitian better to meet the many problems that have arisen and will arise during the course of the war.

Mary Harrington, chairman of general arrangements, writes that the membership of local committees has been selected, a total of eighteen committees, each with specific responsibilities, having been chosen. Of these, for instance, Winning Pendergast is chairman of hospitality, Jane Porter, of menus, Mrs. Lena Proctor, of trips, Donna M. Ensign, of guest reservations, and Mrs. Mary Harmon Riste, of press tables.

Detroit for a convention city is a fortunate selection for this year. It's a city in the center of active war production. And a short distance across the Detroit River is Canada, our ally in this world conflict. Even if passes won't be available to vital factories to see bombers or tanks made, at least you'll know by the hustle and bustle that war machines are being turned out. If you have time there is always Greenfield Village to visit, the museum of early Americana. And if you want to get away from it all, do visit the zoo where animals roam in native habitat protected by moats instead of high fences.

Within an hour's ride, two of the leading educational centers of the midwest are located, namely, Michigan State College at East Lansing and the University of Michigan at Ann Arbor.

There is always beautiful Belle Isle, one of the most scenic amusement parks in the Middle West.

So come to the automobile center of the world, where automobiles are not being made for the duration; come by bicycle or on foot, by train or plane, but come to the silver anniversary convention of the American Dietetic Association. —*Eleanora Sense, Chairman, Press Relations, American Dietetic Association.*

Calling All Dietitians!

This was the heading of a communication addressed to dietitians of the State of Kansas by Mrs. Bessie Brooks West, which said in part: "As the dangers and disasters of war become increasingly real and menacing to us, we are aware that the call to feed civilians under emergency conditions may come at any time. This means *your help* is needed—and that may be sooner than we realize."

In a message to her students at Kansas State College, Mrs. West wrote: "As the United States finds itself in an ever deepening emergency, there is acute need for women trained in food service who are able to direct emergency feeding units in cases of disaster. The women on this campus who have the best background for this patriotic service are those Home Economics students who are majors in Institutional Management and Dietetics, and those other students who have taken the course in School Food Service."

The question "Do dietitians serve?" was well answered in the response to Mrs. West's appeal. From the Kansas Dietetic Association membership of only forty-one, more than thirty dietitians attended the three-day refresher course given at Kansas State College, and they, in turn, plan to interest their communities in canteen courses. Forty-five out of fifty students who were eligible for the canteen aide course on the campus have completed the requirements.

An outline of the program as presented in the refresher course appears under the News Notes section of this JOURNAL.

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